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USSR Report

ENERGY

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ENERGY

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PROBLEMS IN OIL AND GAS POTENTIAL DISCUSSED AT 27TH CONGRESS

Baku AZERBAYDZHANSKOYE NEFTYANOYE KHOZYAYSTVO in Russian No 11, Nov 84 pp 58-60

[Article by Kh. B. Yusufzade, A. I. Aliyev and A. A. Narimanov: "Oil and Gas Questions at the 27th International Geological Congress"]

[Text] The 27th session of the International Geological Congress, in the work of which participated representatives of 112 countries of the world, including the U.S., Canada, Great Britain, France, the FRG, Japan and China, met in Moscow August 4-14, 1984.

This is the third time our country has hosted the geologists of the world. Two Previous international congresses of geologists have been held in our country in 1897 and 1937. Thanks to the general advance of geological science in our country, the period since the 17th session of the International Geological Congress, which met in Moscow in 1937, has seen the development of a reliable raw material base to support the harmonious growth of the most important sectors of our national economy.

The scientific program of the 27th session of the International Geological Congress inluded a broad range of geological questions divided into 22 sections. A number of the most important problems were also discussed in intersectional symposiums and colloqiums. Some 2500 papers and 500 reports were delivered over the course of the congress.

More than 20 of our republic's leading academic and industrial geologists took part in the work of the congress, among them M. T. Abasov, A. A. Ali-Zade, Sh. F. Mekhtiyev and E. Sh. Shikhalibeyli, academicians of the Azerbaijan SSR Academy of Sciences, academicians A. Alizade and S. G. Salayev, corresponding members of the Azerbaijan SSR Academy of Sciences, E. M. Shekinskiy, chief of the republic's geology administration, and A. N. Guseynov and Kh. B. Yusufzade, chiefs of the Azneft' and Kaspmorneftegazprom association geological services.

In meetings of section 13, specialists from almost 100 countries discussed questions concerning oil and gas, which covered a broad range of problems dealing with the oil and gas potential of the various continents and their offshore areas, stages in the formation of oil and gas, forecasting the oil and gas content of deep-lying formations and the phase state of hydrocarbons, degasification of the stratisphere and mud volcanoes. The various sections and intersectional symposiums heard a total of 86 papers, 5 of which were delivered by scientists from our republic.

There is great concern in many countries of the world today that we are exhausting the fuel and energy resources of our planet, particularly our oil and gas. Of special interest to the congress in this connection was the paper presented by Professor M. T. Khelbuti [transliterated] (US), who pointed out that we are not yet fully exploiting major reserves of oil and gas remaining in the various shelves around the world ocean, in complex traps of a variety of morphogenetic types and in deep-lying horizons and, finally, in regions of the Earth's surface to which access is difficult (the Arctic and deepwater basins, for example). M. T. Khelbuti's paper identified some 600 sedimentary basins around the world with a total area of 77.6 million km^2, of which the presence of oil and gas in commercial quantities has been established in almost 160 basins, 240 have been partially explored or explored to the extent of representative sampling, but some 200 of these basins remain unexplored entirely or to only a limited extent.

There is therefore every reason to believe that by exploring and developing these regions and traps to which access is difficult we will see in the future the opening up of major new deposits of oil and gas equalling in terms of total reserves worldwide discoveries over the course of the entire history of oil and gas exploration. For evidence of the truth of this we can look to the discovery in 1979 of the large Hibernia oil field off the coast of Newfoundland, which has reserves of 300 million tons, or the 1968 discovery in the severe climatic conditions of Alaska of the giant Prudhoe Bay field with its initial reserves of more than 3.0 billion tons of oil and some 740 billion m^3 of gas.

Also attracting great attention at the congress was the report presented by Professor V. V. Semenovich, chief of oil and gas geology and exploration operations for the USSR Ministry of Geology, which dealt with problems involved in studying the oil- and gas-bearing basins of the USSR, where we have laid out the main directions for further expansion of the raw material base for the country's oil and gas industry. Among the most pressing problems in the area of oil and gas exploration Professor Semenovich included the forecasting, search and exploration of nonanticlinal traps and deposits in deep-lying horizons as well as gas-condensate deposits with high percentages of condensate in the gas phase, study of the thermobaric conditions producing liquid-phase hydrocarbons, exploration and development of gas-hydrate deposits and the search for nonanticlinal deposits under the permafrost region.

Professor I. P. Zhabrev, chief of the geological service of the Ministry of the Gas Industry, delivered a paper focusing on the problem of determining the gas content of saliferous basins, in which he summarized data on the world's oil- and gas-bearing basins with evaporite caps (the Persian Gulf, the western part of the Gulf of Mexico, the southern part of the North Sea, eastern Central Asia, the Volga-Urals province and the Caspian Basin among others) and analyzed the importance of these basins in the distribution of hydrocarbon resources.

A presentation by Professor S. P. Maksimov (jointly with I. P. Labrushko), director of All-Union Scientific Research Institute of Petroleum Geology and Exploration, looked at conditions for the formation of major accumulations of oil and gas and analyzed a large volume of data on important deposits around the world in which we find a substantial proportion of the established reserves of oil and gas.

This question is of fundamental importance for focused exploration for the giant fields, which form under the right combination of all conditions necessary for the

generation, accumulation and preservation of fluid hydrocarbons in large, primarily platform sedimentary basins.

The 27th session of the International Geological Congress gave a great deal of attention to the question of oil and gas formation in sedimentary basins in the Earth's crust. Both Soviet and foreign scientists delivered papers presenting the results of new studies of the stages and deep-lying zonation of oil and gas formation in different types of basins and their effect on the distribution of oil and gas (A. A. Trofimuk, V. S. Vyshemirskiy, A. E. Kontorovich et al.) and discussing topics such as oil source beds and the stages and cyclical nature of the oil- and gas-formation process (T. A. Botneva, S. P. Maksimov, Ye. S. Larskaya and R. S. Pankina), the modelling of hydrocarbon formation in sedimentary basins (M. Lepotr and F. Unzhere [transliterations] of France), the evolution of kerogen and the generation of oil (Ling Roungnang, China) among others.

The results of studies conducted by Soviet scientists (A. A. Trofimuk et al.) can be seen as an important achievement in this field. These investigators have shown that under certain thermodynamic conditions, the gas of biochemical genesis can accumulate in sediment in the form of crystal hydrates, the industrial exploitation of which will constitute an important task for the future.

Soviet scientists (N. V. Cherskiy, V. G. Vasil'yev and Yu. F. Makogon), as we know, are due the credit for discovering gas-hydrate deposits in permafrost regions, the importance of which cannot be estimated, considering the fact that the decomposition of 1 m^3 of gas-hydrate can yield as much as 200 m^3 of gas. In their paper, "Phase Transitions within the Earth's Crust and their Effect on the Formation of Natural Gas," A. A. Trofimuk, Yu. F. Makogon and M. V. Tolkachev estimated the planet's reserves of gas in the crystal hydrate state at 15,000 trillion m^3 underground, which includes more than 100 trillion m^3 under permafrost, and over 100,000 trillion m^3 underwater. These studies could change our view of the upper levels of gas accumulation or gas formation of biochemical origin, which gas does not dissipate from the sediment entirely, as we used to assume, but rather can, under certain thermodynamic conditions, remain in the gas-hydrate state and develop into a source of gas deposits.

The congress also devoted considerable attention to the problem of exploiting oil and gas deposits in deep-lying horizons. As is known, the oil and gas in the upper intervals (down to 4.5 km) have to a certain extent been exhausted in many of the older oil- and gas-producing provinces of the world, while prospects for discovering new fields and deposits are limited due to the declining number of promising structures and traps in the upper structural stage (deposit complex). So not only must we develop our oil and gas resources in new oil- and gas-bearing provinces, we must also attend to the particularly urgent task of searching, exploring and developing hydrocarbon deposits at great depths.

At the present time 47 countries are searching for deep-lying oil and gas deposits. Presentations by both Soviet and foreign scientists looked at the most important problems involved here, for example, the following: the oil and gas potential of deep-lying horizons based on data obtained from recent superdeep drilling (A. N. Zolotov, M. I. Lodzhevskaya, S. N. Simakov et al.), lithologic indicators of oil and gas potential and methods of forecasting deep-lying reservoirs (O. A. Chernikov, P. A. Karpov, V. V. Stasenkov et al.), the oil and gas potential of deeply buried platform

systems of recent origin in the USSR (A. A. Trofimuk, V. S. Vyshemirskiy, V. A. Beneson et al.) and forecasting the phase state of hydrocarbons at depths below 5000 m (G. S. Kalmykov and A. S. Rovenskaya).

The congress also heard with interest the presentation of Sh. F. Mekhtiyev, Z. A. Buniatzade and A. A. Narimanov dealing with the oil and gas potential of deep-lying areas of the Southern Caspian Basin.

It should be pointed out here that the problems involved in searching for oil and gas at great depths in our country were dealt with for the first time in the late 1950's in Azerbaijan. The most promising possibilities for increasing oil and gas production in Azerbaijan, both on land and off shore, are now seen to lie in the deeper-lying horizons, so in this connection the problem of searching, exploring and developing the superdeep hydrocarbon deposits is of the greatest importance for both Azerbaijan and the southern Caspian.

In view of the important role mud volcanoes [gryazevoy vulkanizm] play in natural geological phenomena and their significance as a criterion upon which we base forecasts of oil and gas potential, the congress for the first time devoted particular attention to this question. For the fact is, after all, that our republic and the adjoining area of the southern Caspian Sea constitute one of the world's classic areas of mud volcano activity and the mud volcano theory was developed right here by Academic I. M. Gubkin and elaborated by other Azerbaijani geologists who studied under him. The main speakers included Azerbaijani scientists A. A. Ali-Zade, F. G. Dadashev, B. V. Grigor'yants and Ad. A. Aliyev (joined by S. G. Salayev, R. R. Rakhmanov and I. S. Guliyev).

Congress attendees also demonstrated great interest in papers by Soviet and foreign scientists dealing with geological structures and the oil and gas potential of offshore areas.

Recent years have seen significantly increased interest in the industrially developed countries of the world in the problem of exploiting the oil and gas resources under the world's seas and oceans. The knowledge we have accumulated to date on the Earth's mineral raw material resources is limited to all of one-fourth of it's surface. The remaining three-fourths of the Earth's surface, which is covered by ocean, remains virtually unstudied entirely, although it is true that more than 100 countries with access to the sea are exploring for oil and gas in the offshore shelf, while more than 40 countries are already producing oil and gas from offshore fields.

In their report to the congress, K. Bua, P. Bushe, A. Maskl [transliterated] et al. of the French Petroleum Institute discussed the global geological history and the oil and gas potential of the deep-water margins of the continents from the point of view of the tectonics of the lithospheric plates, pointed out that the conditions most conducive to the generation and accumulation of fluid hydrocarbons are characterized by passive continental margins, which contain 83 per cent of the reserves of oil and 91 per cent of those of gas to be found in all continental margins.

Of particular interest was the presentation of N. A. Yeremenko, M. K. Kalinko, L. E. Levin and V. Ye. Khain, which focused on the oil and gas potential of the zones of transition between the continents and the oceans, zones which are heterogeneous formations varying in age and with which are associated different genetic types of oil- and gas-bearing basins.

In their paper, Yu. K. Burlin, A. A. Geodekyan, N. A. Krylov and L. I. Lebedev looked at various types of sedimentary basins and oil and gas formations along continental boundaries. A number foreign scientists discussed the oil and gas potential of specific continental shelves.

The congress devoted considerable attention to the problem of exploiting nontraditional sources of energy. Everyone is aware of the fact that increasing consumption by the industrially developed countries of the world is rapidly depleting our traditional sources of energy (oil, gas and coal). It is enough to point out that world energy consumption has increased more than ten-fold over the course of our century alone and by the 21st century could reach 16-17 billion tons of standard fuel. So traditional sources are not going to be able to satisfy this continually growing demand for energy. The rate at which we are developing oil, gas and coal sources in remote areas of the world is not enough to keep pace.

Worldwide attention is therefore focusing on the problem of exploiting nontraditional sources of energy (sources of thermal energy deep within the Earth, bituminous sands, fuel shale, solar energy etc.).

Congress attendees showed great interest in discussions by Soviet scientists dealing with the USSR's sources of geothermal energy and prospects for exploiting them (G. V. Kulikov, G. S. Vartanyan, B. F. Mavritskiy and A. A. Shpok) and the process and world use of underground coal gasification (N. A. Fedorov, Ye. V. Kreynin and K. N. Zvyagintsev).

P. Grew (U.S.) delivered a paper in which he presented data on the resources of the most important geothermal regions of California and discussed the industrial exploitation of geyser thermal sources (geothermal steam). According to P. Grew's information, at a depth of 2000 m a well drilled for geothermal steam in California found a steam temperature of 365°C. In the view of this researcher, anomalies in the heat flow in California are to be associated with a spreading zone.

According to K. Korim, the Hungarians have built heat collectors covering an area of 2 million m^2 over thermal water, of which they have supplies estimated at 50 billion m^3 (located in the Hungarian part of the Pannonian basin).

Our republic possesses large potential reserves of all types of nontraditional energy sources (high-head geothermal water in Kyurdaminskiy Rayon and fuel shale and bituminous sand on the Apshironskiy peninsula and in Kobystan, for example), the problem of the industrial exploitation of which should become an increasingly important focus of national economic attention.

We should also mention papers Azerbaijani scientists delivered at meetings of other sections. M. T. Abasov, L. A. Buryakovskiy and I. S. Dzhafarov discussed the problem "Modeling hypothetical hydrocarbon reserves," while B. A. Bagirov spoke on the topic "Integrating classification models in petroleum geology."

Congress participants also had a chance to familiarize themselves directly with the status of a number of geological questions and oil and gas production operations by taking any of five field trips offered to a variety of sites through Azerbaijan. They visited Neftyanyye Kamni, the superdeep borehole at Saatly, a number of mud volcanoes and some interesting outcroppings and familiarized themselves with the ophiolite complex of the Lesser Caucasus.

"Each session of the International Geological Congress," Professor Ye. A. Kozlovskiy, USSR minister of geology and president of the 27th session, declared, "represents an accounting of results of tests of scientific hypotheses and theories previously advanced and at the same time marks out new directions of advance in geological science and practice." And in this sense, in the general estimation of representatives of the most advanced thought in geology, the Moscow International Geological Congress proved most productive.

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OIL AND GAS

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OIL, GAS CONTENT OF MURADKHANLY, ZARDUB EVALUATED

Baku AZERBAYDZHANSKOYE NEFTYANOYE KHOZYAYSTVO in Russian No 11, Nov 84 pp 17-20

[Article by M. A. Gyul'dust, AzNIPIneft': "The Gas and Oil Potential of Fractured and Cavernous-Fractured-Porous Reservoirs in the Vicinity of Muradkhanly and Zardob"]

[Text] From the point of view of their gas- and oil-bearing potential, the fractured and cavernous-fractured-porous reservoirs, which are spread extensively throughout the Upper Cretaceous and Eocene deposits, have been studied within the limits of the Muradkhanly, Zardob and Sovetlyar buried uplifts in the southeastern part of the Evlakh-Agdzhabedinskiy geoblock of the Kurinskaya basin, where these reservoirs are associated with the presence of both screened and thinning deposits of oil and gas. The Muradkhanly and Zardob uplifts, which comprise part of the Dal'mamedli-Duzdag-Muradkhanly anticlinal zone, have most frequently been studied through drilling, and a number of questions concerning the geology and oil and gas potential of these formations have been discussed in [1-5]; the tectonic structure, however, which reflects the nature of the distribution of the oil and gas, has so far not received adequate attention. Our objective has been to shed some light on the nature of a number of tectonic factors, which will enable us to solve certain problems associated with the exploration and development.

The tectonic structure of the Muradkhanly and Zardob uplifts and of other undulations in this anticlinal zone (the Yevlakhskaya and Eastern Yevlakhskaya) exhibits three highly distinct structural stages: the Mesozoic, the Paleogene-Miocene and the Pliocene-Quaternary. In the first structural stage the uplifts exhibit a more defined and complex structure due to the activity of the Dal'mamedli-Kyrmyzykendskiy (Southern Kurinskiy) regional fault and a number of other fractures as well as to lava flows. These uplifts have amplitudes of roughly 1000 m. The uplifts of the second stage have a relatively less well-defined structure, since the Paleogene-Miocene deposits are enveloping deposits, while in the third stage the folds are buried and the Pliocene-Quaternary complex horizontally overlaps their levelled surface.

We employed the palinspastic method for the first time to study the structure of the Muradkhanly buried high and prepare block diagrams making it possible to shed light on a number of questions associated with exploration and development: directions in which to search for other oil and gas deposits in the unexplored tectonic blocks of the above-mentioned reservoirs and assessing the oil and gas potential of these reservoirs. The block diagrams, which have been constructed with reference to the location of the surface of the Cretaceous deposits (a) and the top of the Chokrak

horizon (b) (Figure 1), give some idea of the formation of the first two structural stages and so of the blocks comprising them. Development of the block structure then establishes the linkages and regularities in the distribution of the oil deposits.

Tectonic movement subjects the Muradkhanly and Zardob regions to intense upheaval against the background of the Kurinskaya cordillera [3], which, on one hand, produces intense dislocation creating the blocks and steps in the structures (which at the same time causes fracturing) and on the other erodes the effusive and sedimentary rock in the center and north. Lithologic-petrographic analysis of the Mesozoic-Paleogene rock shows that erosion has occurred primarily over the course of the Upper Cretaceous and Early Paleogene times, since during the Presantonian accumulation of Upper Cretaceous sediment the effusive rock was subjected to deep erosion, where the andesite-porphyritic effusion was denuded to the paleotypic andesite-basalt composition*, while during the Early Paleogene we see erosion of the carbonate (Danian-Campanian) and volcanic-sedimentary (Campanian-Santonian) rock, only the lower part of which, a member 10-35 m thick, could remain within the central trough blocks of the Muradkhanly structure (here the latter overlap the eroded surface of the paleotypal effusive).

Due to the intensified rate of uplift of the Lesser Caucasus and the weakening of tectonic movement in the vicinity of the Kurinskaya cordillera, the Upper Eocene sees the basin gradually expand northward, and the previously eroded areas are overlapped by Upper Eocene and Maykop deposits. In forming caps, the overlapping of the Cretaceous effusive and volcanic-sedimentary cavernous-fractured-porous reservoirs by the argillaceous sediment of the Upper Eocene and Maykop played an important role in the formation and preservation of the oil and gas deposits here. It should be pointed out that the preservation in the center of the Muradkhanly uplift of a member of the lower portion of the volcanic-sedimentary rock, which overlapped the eroded surface of the paleotypal effusive, and the absence of (erosion) of this member in the western tectonic block, which still contained more recent effusive rock, show that peripheral cross faults (as high as 400 m in amplitude) formed toward the end of the Paleogene, when fluids could migrate from the deep and depressed parts of the geoblock and accumulate in the fractured reservoirs of effusive and volcanic-sedimentary rock in the uplifted part of the structure.

The oil and gas potential of the Mesocenozoic deposits in the Muradkhanly and Zardob uplifts and of the undulations west of them (see Figures 1-3) is linked to the cavernous-fractured and porous reservoirs of both Upper Cretaceous effusive rock, which underwent a prolonged period of hypergenetic change, and the sedimentary formation of the Paleogene-Miocene. The presence of commercial deposits in reservoirs in effusive and volcanic-sedimentary rock in a number of tectonic blocks has been proven. Oil inflows have also been discovered on the southwestern sides of these structures in reservoirs of thinning Lower and Middle Eocene deposits as well as in the center of Muradkhanly in reservoirs of Miocene (Chokrak) deposits. In taking account of the nature of the distribution and oil and gas saturation of the Cretaceous and Paleogene-Miocene reservoirs, it should be observed that future prospects are linked to the Santonian-Campanian Cretaceous-volcanic sedimentary, effusive (recent and paleotypal) and Campanian-Maastrichtian carbonate rock comprising part of the arched and southwestern limbs of the uplifts and the western portion of this geoblock, where screened

* According to data from potassium-argon studies, the andesite-basalt composition of the effusive rock has an absolute age of 94-96 million years, the andesite-porphyrite one of 74-76 million years [5].

deposits are assumed to be present. Fractured reservoirs in the aleurite-marlaceous members of the Lower and Middle Eocene, which wedge out along the side of the geoblock, may also prove to be traps for the formation of oil and gas deposits, which

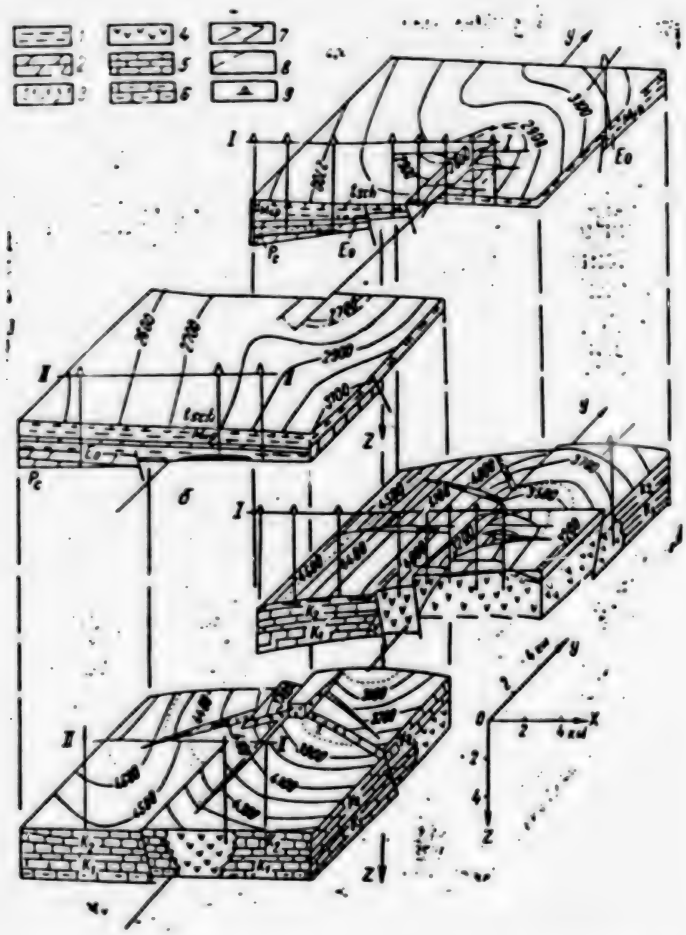

Figure 1. Block diagrams of the Cretaceous (a) and Paleogene-Miocene (b) deposit complexes of the Muradkhanly buried uplift.

1 - clays; 2 - marls; 3 - tuff sandstone; 4 - effusive rock; 5 - limestone; 6 - argillite; 7 - isolines; 8 - contours of deposit distribution; 9 - boreholes.

is confirmed by the presence of oil deposits where they thin out in the vicinity of Muradkhanly and Zardob. It cannot be excluded that as the beds drop toward the west the thinning fractured reservoirs in the Maykop suite and the Cholrak horizon may also prove to contain gas and oil.

The block diagrams and diagrams of sediment distribution (see Figures 1, 3) show that in the Muradkhanly and Zardob deposit the thinning areas of the cavernous-fractured and fractured-porous reservoirs in the Mesocenozoic deposits and the distribution of oil deposits within the individual tectonic blocks do not coincide in either area or section; exploration operations should therefore take account of both the location of the contours of the gas and oil presence and the limits of the thinning deposits at the various structural stages.

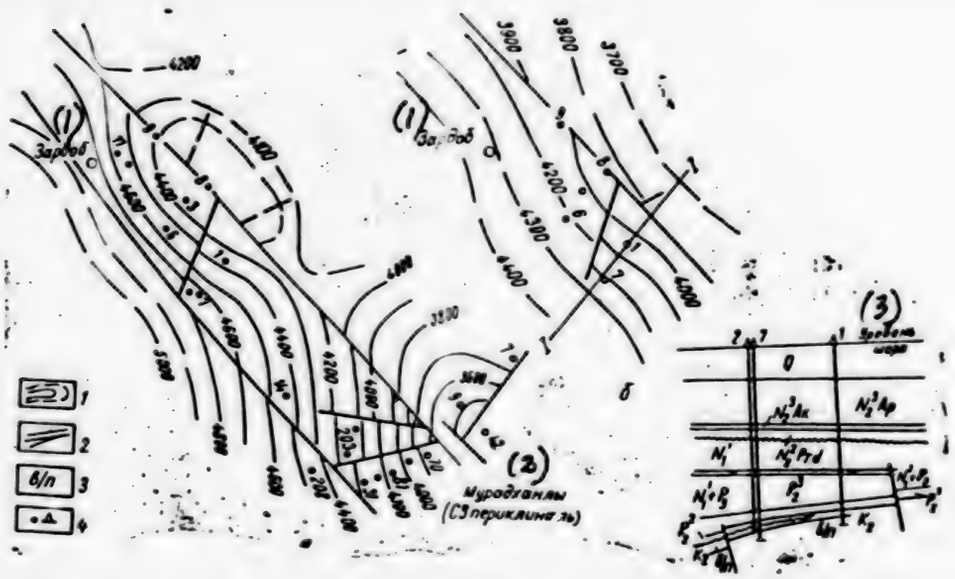

Figure 2. Structural maps of the Zardob buried high along the surface of the Cretaceous (a) and the top of the Eocene (b).
1 - isolines; 2 - dislocations with a break in continuity; 3 - volcanic member; 4 - - prospecting borehole.
(1) Zardob; (2) Muradkhanly (NW periclinal); (3) sea level

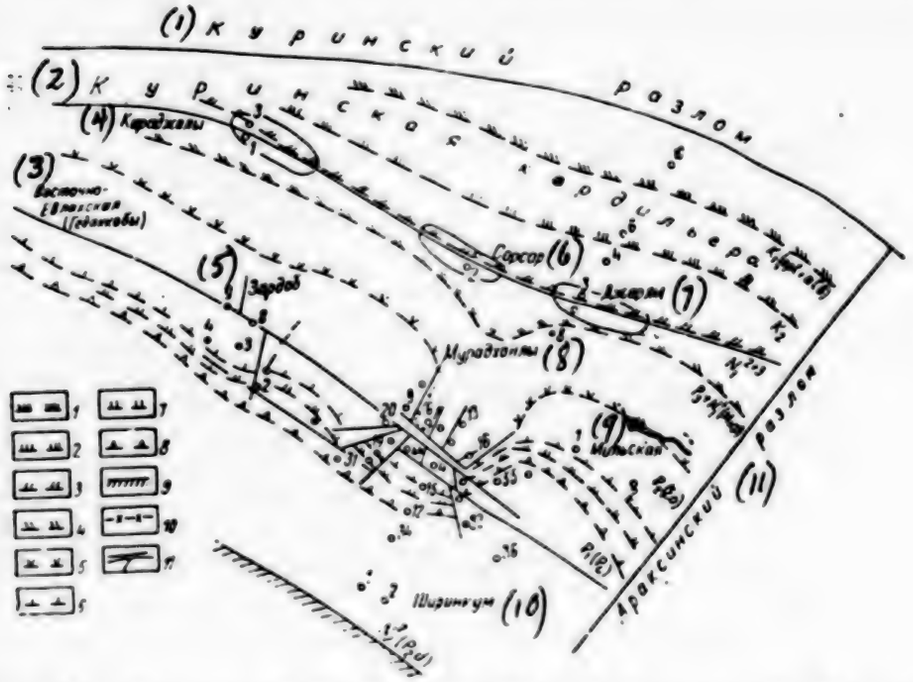

Figure 3. Diagram of the distribution of Mesocenozoic deposits

1, 2 - limits of the erosion of Lower and Upper Cretaceous deposits; 3, 4, 5, 6 and 7, 8, 9 - extent of Sarmatian, Chokrak-Maykop, Eocene and marlaceous oil- and gas-bearing members (I-II) of the Eocene, Paleocene deposits of the productive strata; 10 - zone of erosion of tufogenic sedimentary rock; 11 - faults
(1) Kurinskiy fault; (2) Kurinskaya cordillera; (3) Eastern Yevlakhskaya (Gedakkoby); (4) Karadzhaly; (5) Zardob; (6) Sorsor; (7) Dzharly; (8) Muradkhanly; (9) Mil'skaya; (10) Shirinkum; (11) Araksinskiy fault

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OIL AND GAS

BULLA ISLAND AREA OIL AND GAS POTENTIAL

Baku IZVESTIYA AKADEMII NAUK AZERBAYDZHANSKOY SSR: SERIYA NAUK O ZEMLE. NEFT' No 4, 1984 (signed to press 26 Dec 84) pp 104-108

[Article by F.M. Guseynov, O.A. Markarova and T.N. Saradzhev: "Stratification Characteristics of the NKP Suite in the Sangachaly-More/Duvannyy-More/Bulla Island Field and its Oil and Gas Potential"]

[Text] The Baku Archipelago is one of the promising areas on the western shore of the Caspian basin. The Sangachaly-More, Duvanyy-More, Bulla Island, Bulla-More, Garasu Island and Alyaty-More fields have been discovered here, of which the first two are currently being developed and the remainder are being explored.

The first discovery well, No. 24, on the crest of the northeast flank of the Sangachaly-More/Duvannyy-More/Bulla Island structure showed commercial oil potential in 1963 when testing the UP zone (the "dividing" formation).

In the same field, the USh zone of the NKP suite and the U zone of the Balakhansky suite were shown to bear oil, gas and condensate.

By analysis, the UV bed in the USh zone contains gas and condensate with an oil fringe, the UP zone contains oil and gas and the U zone oil and condensate.

Experimental production of the USh zone was begun in 1969 after well No. 84 in the Duvannyy-More field was tested. It flowed gas and condensate.

Later, gas and condensate flows were also obtained in well tests in Blocks III and IV in the Duvannyy-More field and Blocks V and VI in the Bulla Island field.

All the producing wells are located on the northeast flank of the Sangachaly-More/Duvannyy-More/Bulla Island structure. Oil and gas shows at well No. 562 in Block IV indicate an oil fringe in Zone VIII. Recently, Zone VIII in the Bulla Island field has also been shown to bear oil and gas (well No. 56), which confirmed the zone's high potential in other areas of the Baku Archipelago.

Lithologically, Zone VIII is a fine alternation of sands, silts and clays. Its thickness varies from 0 to 70 m. In the western part of the Sangachaly-More/Duvannyy-More/Bulla Island structure, there is a notable area where Zone VIII does not appear (Fig. 1). From here, the zone increases in thickness as the northeast flank and the southeast pericline of the structure dip. Lithological and facies conditions improve in the same direction: sands increase, clays decrease and the profile shows thicker and more frequent interbedded sands.

Analysis of well data from the northeast and southwest flanks show markedly less favorable lithological and facies composition in the southwest flank compared to the southeast (well No. 563 in the Bulla Island area).

From a comparison of the electric logs taken in wells Nos. 19, 38, 99, 83 and 97 (Fig. 2), it is clear that Zone VIII does not appear in the profiles of wells Nos. 19 and 38 on the southwest flank of the Sangachaly-More field and that thinner (120 m) beds of the oil-, gas- and condensate-bearing suite are found above underlying PT [producing strata] sediments, which is a stratigraphic variance.

Microfauna analysis of cuttings from well No. 19 from a depth of 3696 to 3916 m and below show that the rock is underlying PT sediments (a diatomaceous formation). Thus, electric log curves and microfauna data give reason to assume that in wells Nos. 19 and 38 on the southwest flank, a series of beds is missing from the oil-, gas- and condensate-bearing formation (Zone VIII) to the KaS, inclusively. Further in the same direction, the lower-level PT beds are seen in virtually their maximum thickness and are represented in all suites in the profiles of wells Nos. 99, 83 and 97 in the southeast flank of the field.

Comparison of electric logs from wells Nos. 534, 550, 27, 3 and 82 (Fig. 3), which are located on the southwest flank, show that the oil-, gas- and condensate-bearing suite (Zone VIII) also does not diverge and that thick clays underlie the oil-, gas- and condensate-bearing formation in the profiles of wells Nos. 534, 550 and 27. These clays are reflected on the electric logs as monotonic PS [not further identified] curves, and ρ for the latter values does not exceed 2 to 2.50 mm.

In spite of the fact that microfauna analysis indicates that beds lying at a depth of 4,143 m in well No. 534 belong to the Sarmatsky stratum while beds lying at 4,435 m in well No. 550 are diatomaceous, there are nevertheless good reasons for also tentatively assigning the entire formation between the floor of the oil-, gas- and condensate-bearing formation and the clays to the underlying sediments.

Almost the same picture is given in well No. 27. Microfauna analysis of the levels from 3600-3644 m and 3671-3675 m below the oil-, gas- and condensate-bearing formation is inconclusive, and only a sample taken by ambrose from a depth of 3,701 m showed that the rock belongs to the diatomaceous formation.

Further, Zone VIII appears in well No. 3 as a clayey facies with a reduced thickness of 32 m and a Kirmansky suite, but in well No. 82 the full profile of the lower-level PT appears and Zone VIII is of normal thickness.

It should be pointed out that in the Alyaty-More field, which is half a kilometer from the field studied here, the wells near the crest and on the eastern pericline where the oil-, gas- and condensate-bearing formation appears hit the underlying PT beds just as they do on the southwest flank of the Sangachaly-More/Duvannyy-More/Bulla Island structure.

The absence of lower-level PT sediments from the profiles of individual wells (with the exception of the oil-, gas- and condensate-bearing formation) is explained by peculiarities in the accumulation of sediment and the region's paleotectonic development.

The oil and gas potential of Zone VIII now being developed in the Sangachaly-More/Duvannyy-More/Bulla Island field, which has been the object of exploratory efforts up to now, is linked to the search for reservoirs of the lithostratigraphic type occurring in the area where it tapers out, apparently where it was uplifted in the Myocene on the southwest flank of the structure in the case of the Sangachaly-More field and in the uplifted area of the Alyaty-More field..

The potential for oil, gas and condensates of Zone VII on the southwest flank of the Sangachaly-More/Duvannyy-More/Bulla Island structure is confirmed by flows from Zones V and VII in the Bulla Island field, although the lithological facies composition of the zone studied in this article is somewhat less favorable than on the northeast flank.

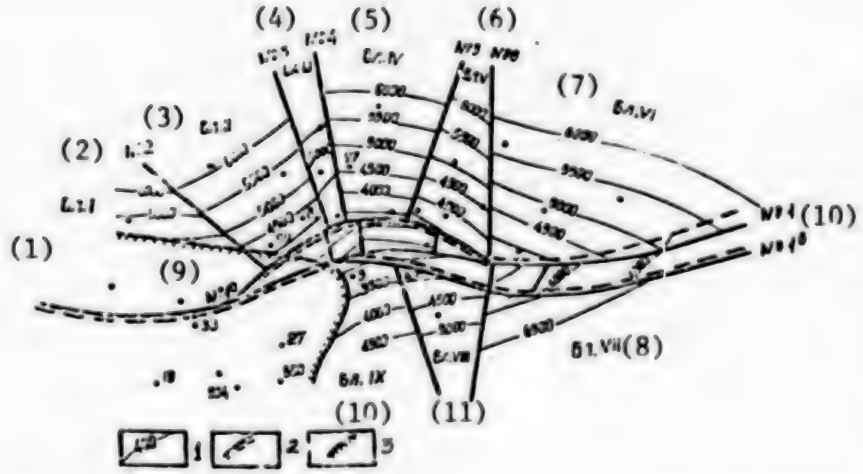

Fig. 1. Sangachaly-More/Duvannyy-More/Bulla Island Field. Structural Map of the Roof of PT Zone VIII. 1. Contours. 2. Tectonic Destruction Lines. 3. Zone VIII Limit.

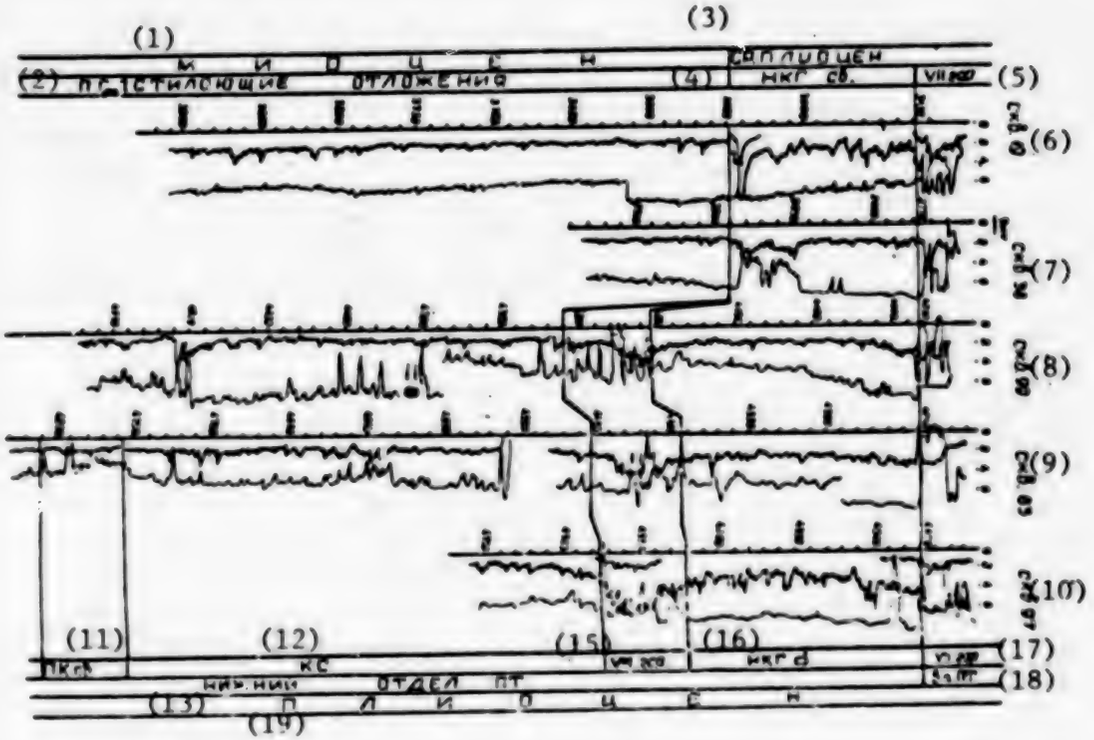

Fig. 2. Sangachaly-More/Duvannyy-More/Bulla Island Field. Comparison of Well Profile Logs.

1 Miocene
2 Underlying Sediments
3 Pliocene
4 Oil-, Gas- and Condensate-Bearing Zone
5 Zone VIII
6 Well No. 19
7 Well No. 38
8 Well No. 99
9 Well No. 83
10 Well No. 97
11 PK Formation
12 KS
13 Lower-level PT
14 Pliocene
15 Zone VIII
16 Oil-, Gas- and Condensate-Bearing Zone
17 Zone VII
18 PT

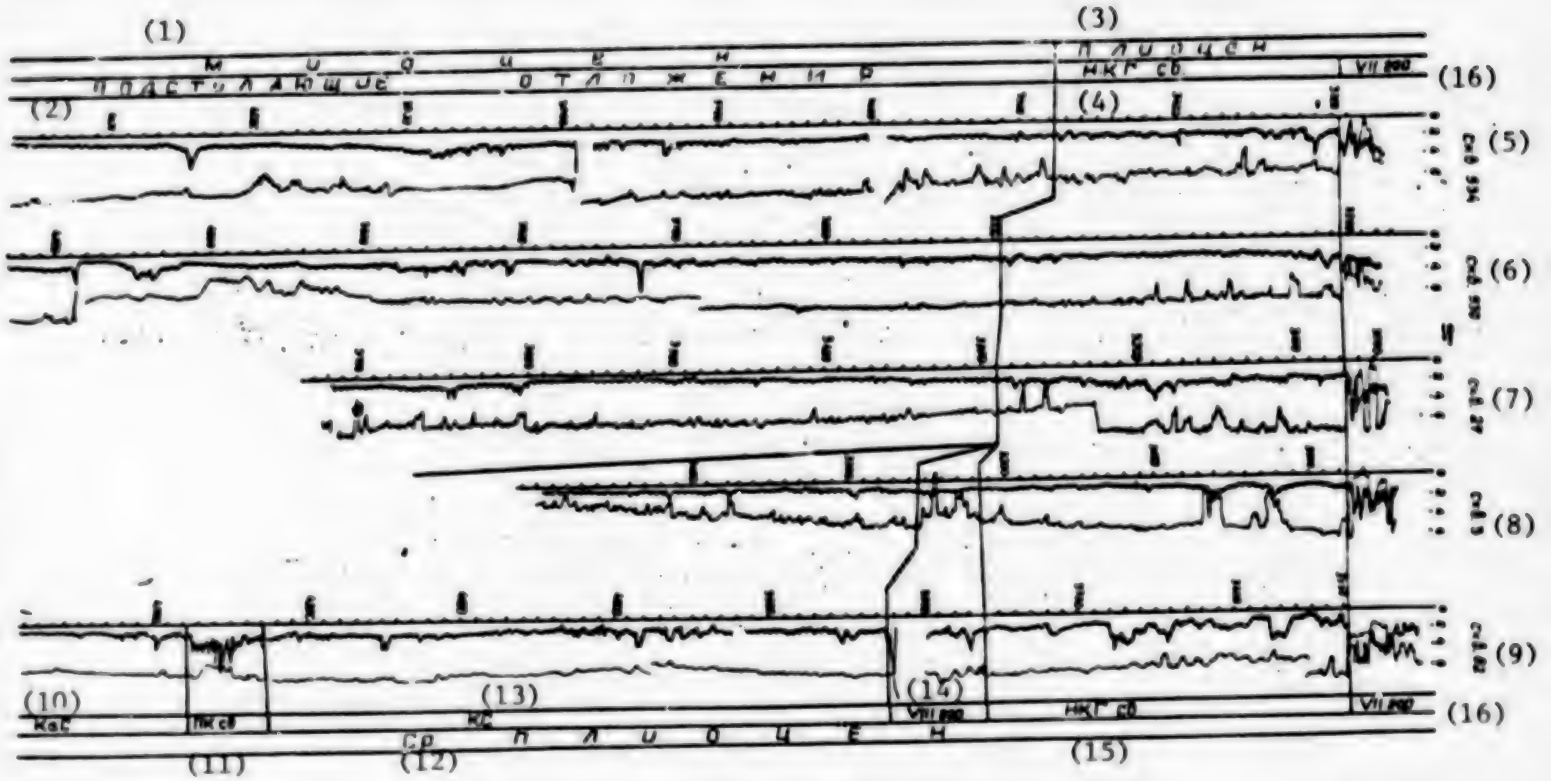

Fig. 3. Sangachaly-More/Duvannyy-More/Bulla Island Field. Comparison of Well Profile Logs.

1 Miocene
2 Underlying Sediments
3 Pliocene
4 Oil-, Gas- and Condensate-Bearing Formation
5 Well No. 534
6 Well No. 550
7 Well No. 27
8 Well No. 3
9 Well No. 82
10 KaS
11 PK Formation
12 Middle Pliocene
13 KS
14 Zone VIII
15 Oil-, Gas- and Condensate-Bearing Formation
16 Zone VII

8844
CSO: 1822/201

OIL AND GAS

BRIEFS

KAMCHATKA GAS DISCOVERY PROMISING--For some time, the so-called Kolpakovsky trough on the western coast of Kamchatka has been attracting attention from geophysicists. They have thoroughly researched it and concluded that it is a highly promising region for oil and gas exploration. The Kamchatka oil and gas exploration expedition from the Sakhalingeologiya Industrial Association concentrated its main efforts here. Drilling confirmed that exploration was justified. Some wells flowed oil- and gas condensates. When Well No. 5 at the Kshuksky field was tested, there was a strong, commercial gas flow. The well test flowed over 300,000 cubic meters of dry methane per day on a 15-mm choke. Kamchatka needs this gas badly. At the present time, its energy base is largely coal and fuel oil. Delivery of these fuels from the central and eastern parts of the country is not cheap. And the consumption of thermal energy and electricity is increasing annually. Not only can gas-fired heat and electric power plants better meet the needs of the industrial centers of Petropavlovsk and Yelizov, but they also avoid polluting the air with coal dust, smoke and sulfur emissions. "We believed in Kamchatkan oil and gas," said Head Geologist V.K. Koz'yanin, "and even more so now. But we also know that no mere belief, not even the most well-founded, is a discovery until drilling yields a strike. That is the severest, most unbiased judge. In order to supply gas to the economy, we must still drill many wells and determine and prove reserves." Indeed, exploration geologists are faced with an enormous job. In the Kolpakovsky trough alone, as many as ten promising structures remain to be analyzed. This will make it possible to determine the region's gas potential. [Excerpts] [Moscow PRAVDA in Russian 7 Feb 85 p 6] 8844

ASSISTANCE TO TYUMEN-- Checheno-Ingushetiya oilfield workers have sent some 130 experienced specialists in surface and subsurface well workovers and plugging back as a working shock brigade to assist their colleagues in Tyumen. The workers of Grozny sent their best representatives to the North. Famous surface and subsurface well workover brigades, headed by V. Zaytsev, A. Beschastny, S. Izrailov and A. Makhnychev, will be working at the Nizhnevartovskneftegaz Association. The men from Groznyy are faced with working over 210 wells, 60 of them completely. A special train carrying tools and equipment was dispatched to Siberia from Groznyy. [Text] [Moscow PRAVDA in Russian 7 Feb 85 p 1] 8844

CSO: 1822/181

COAL

IMPROVEMENT OF DRILLING, BLASTING OPERATIONS AT KUZBASS STRIP MINES

Moscow UGOL' in Russian No 1, Jan 85 pp 22-23

[Article by L.M. Reznikov, engineer at Kemerovougol' [Kemerovo Coal Production] Association: "Improvement of Drilling and Blasting Efforts at Kuzbass Mines"]

[Text] The Kemerovougol' Association produces most of the stripmined coal in the Kuzbass [Kuznetsk Coal Basin]. Its yearly output exceeds 54 million tons with 341 million m^3 of total stripping volume. A total of 74 percent of overburden undergoes preliminary loosening by drilling and blasting operations.

The producing coal seams of 1-30 m thickness occur at angles from 0 to 90°. The enclosing rock contains argillite, aleurolite, limestone, blocks of sandstone, and conglomerates of various strength.

The diversity of physical and mechanical properties of the rock and the complex geological stratigraphic conditions significantly complicate the breaking necessary to excavate and haul it away, and require a continuous search for efficient drilling and blasting methods.

The capacity of drills grows along with the unit capacities of excavators, locomotives and dump trucks. During 1965-83, total volume of drilling grew 4-fold and that of blasting 4.6-fold with only 1.7 times greater number of drills due to a larger than average hole diameter, an increased amount of blasted rock per 1 m of blasthole length, and a higher capacity of drills.

At this time, mainly high-performance roller-bit drills are used. The rationalizers of our association, in agreement with the manufacturers, rebuilt currently manufactured drills. In the 2SBSh-200N drills, the capacity of drill pipe magazine is increased which makes it possible to drill deep deviated holes and work inter-laminars up to 45 m thick as one bench. In addition, rock breaking quality and work safety were improved.

In cooperation with the specialists from KuzPI [Kuzbass Design Institute] a drilling method with auger and air-blast cleaning of boreholes was developed and implemented which raises productivity by increasing the drilling

depth of the SVB-2M drills to 3 m and reducing wear of the drilling tools. Presently, new high-performance 3SBSh-200N drills are being introduced at the strip mines of the association.

Annual volume of blast preparation of rock in the association during the last 5 years is about 10 million m^3.

Considerable efforts were made to implement mechanized of charging and stemming ["Zaboyka"] of blastholes and all auxiliary operations in order to assure a continuous increase in the volume of blasting efforts. Mechanized charging was introduced in 1974 at the Mezhdurechenskiy Pit; now it is done at 10 pits.

More extensive increase in mechanized charging is hampered because of the insufficient number of explosive unpacking stations at base warehouses. At pits with less than 4,000 tons of annual explosive consumption, where permanent unpacking stations are not feasible, mobile MPR-30 unpacking units mounted on KrAZ-256B trucks will be used. This will allow to pack explosives in paper or polyethylene bags directly upon unloading from railcars or at a special area designated for temporary storage of explosives. One such mobile unit has been put into operation at the Mokhovskiy pit in 1984.

At present, loading and unloading operations have been mechanized at 3 base and 5 distribution explosives warehouses where belt conveyors and electric battery-driven forklifts are used to transport palleted packages of explosives. However, use of conveyor belts and electric forklifts does not completely eliminate heavy physical labor, since loading of sacks on pallets after unloading from the railcars is not mechanized, as well as leading the pallets on trucks or unpacking station belt conveyors. In order to resolve the entire set of problems it is necessary that the explosives be delivered in soft up to 1 ton capacity containers of the MKR-1, OS, MKR-1, OS, MKR-1, OL type which can be handled with the available base warehouse equipment, thus eliminating the need for expensive unpacking stations.

Experimental delivery of explosives in soft containers was carried out in 1984 in order to develop procedures for unloading of containers, storing them in base warehouses, and packing them directly into the charging devices. The experiment demonstrated a high efficiency of the proposed method. By the end of 1985, the warehouses of the association will be able to receive up to 50 percent of explosives in soft containers.

The association possesses more than 40 MZ-3, MZ-4 and SUNZN-5A types charging machines suitable for mechanical charging.

It should be noted that the design of these machines, particularly their counting and metering devices, do not yet fully correspond to their operating requirements. We need charging machines that can reliably operate on locations with lateral inclines of up to 14-16°.

One of the directions for improving the quality of the preparation of blasted rock are the efforts to use charges with air-filled gas; these efforts are being carried out by the association's specialists in cooperation with the Institute of Hydrodynamics imeni A.A. Skochinskiy. Annual volume of rock preparation by this method rose to 18 million m^3.

In the search for production reserves and speeding up penetration of coal seams, the association's engineering branch has also developed a method of blasting with partial dumping of the overburden into stopped-out areas, and have implemented it at pits with transportless development. Annually, this method provides for up to 5 percent of the untransported overburden to be moved into the dumps.

To reduce outlays for explosives, the association has been using up to 8,000 tons of simple low-cost igdanite [not further identified] explosives during the last 5 years. Further increase of this volume is restrained by the lack of an adequate number of stations for unloading of explosives and loading charging machines and by the low-quality of packing materials.

One of the main problems in drilling and blasting operations is charging of water-filled holes. Association specialists, along with the Kuznetsk Branch of NIIOGR [Science and Research Institute for Open Pit Mining], have solved this problem for ground with low-level water encroachment and a water column up to 3 m high in the boreholes. The lower part of the hole is loaded with up to 40 kg of No. 6ZhV powdered ammonite which forms a type of a plug that prevents wetting of the upper portion of the charge that consists of a non-water-resisting explosive. The bottom of the bench is worked by blast as a result of a hydrodynamic impact.

A method of blasting in the presence of non-draining water with non-water-resisting explosives loaded into previously drained holes was tested. To dry the holes up, an MO-1 machine developed by the Kuznetsk Branch of the NIIOGR was used. In 1983, a prototype of this machine underwent approval tests, and it was recommended for full-scale production.

Another approach for improving efforts to implement non-water-resistant explosives is waterproofing the charges by means of a polyethylene bag. Feasibility of this method was proven in charging experiments through the column of water with and without preliminary draining of roles. Both methods are now undergoing industrial testing in the pits of the association, and will be widely applied in the very near future.

There are significant reserves for reducing labor intensiveness of the drilling and blasting operations in mechanizing stemming of boreholes.

The Kuznetsk Branch of the NIIOGR, jointly with the engineers of the association developed and tested a blasting method for breaking up rock with a reduced volume of stemming work. In 1983 this method was used to develop about 2 million m^3 of rock in the pits of the association; in 1985, this volume is planned to be raised to 20 million m^3.

The Magnitogorsk Seismics Laboratory imeni G.I. Nosov Mining and Metallurgy Institute greatly contributes to the improvement of blasting technology. The specialists of the institute conducted studies and provided recommendations for the implementation of seismically safe blasting procedures during working of blocks up to 500,000 m^3 in volume, which makes it possible to conduct mining operations near residential and industrial buildings, underground workings, large water lines and electric power lines.

The efforts carried out by the association to improve drilling and blasting operations demonstrates the high effectiveness of cooperation between the science and production

12621
CSO: 1822/160

COAL

BRIEFS

PAVLOVSKOYE'S NEW COAL PIT--Vladivostok--The pit put into operation at the Pavlovskoye Field will become a solid fuel base for the Soviet Far East Industry. The first tons of coal have been mined here. The new enterprise is the second phase of the Pavlovskoye pit. Upon reaching its planned capacity, it will supply the factories of the region with 4.5 million tons of coal a year. The new pit has been put into operation exactly according to schedule. An accelerated development of the mining industry in the Soviet Far East will make it possible to create stocks of fuel that are necessary to significantly increase the capacities of power enterprises. [TASS] [Text] [Moscow IZVESTIYA in Russian 9 Jan 85 p 3] 12621

BEREZOVSKAYA COAL CONVEYER--Sharypovo (Krasnoyarsk Kray)--A unique 15 km long conveyer will soon deliver coal from the giant BEREZOVSKIY-1 Pit to the Berezovskaya-1 GRES. The conveyer is now under construction. Each span structure is 30 m long and weighs 50 tons. The conveyer will carry up to 100,000 tons of coal daily. [Text] [Moscow SEL'SKAYA ZHIZN' 1 Jan 85 p 1] 12621

RECONSTRUCTION OF ANGRENSKIY PIT--Angren (Uzbek SSR)--The first stage of reconstruction of the Angrenskiy coal pit, the largest in the Central Asia, has been completed. The state commission has approved the operation of new capacities which will increase coal production here by half a million tons. The start-up complex included over 20 structures, both production and auxiliary. When the reconstruction is completed, the coal production in Angren will double. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 30 Dec 84 p 1] 12621

RSFSR'S BORODINSKIY PIT RECONSTRUCTED--Krasnoyarsk--In the Borodinskiy Pit of KATEK [Kansk-Achinsk Energy Complex], the state commission approved the operation of additional units that will produce a half million tons of coal a year. The reconstruction of RSFSR's largest strip mine has been completed. Its capacity, in accordance with the miners' commitments, has reached the planned level of 25 million tons of coal a year. The enterprise has been totally reequipped during reconstruction. The giant strip mine received modern 1250, 2550 and 5000 m^3/hr excavator, which now mine about 80 percent of total coal output. The stripping is done with 5 prototype EKG-12.5 excavators manufactured by the Krasnoyarsk Heavy Excavators Plant. A significant addition of almost 2 million tons to coal output is being

recovered from the satellite seams which previously were hauled to dumps. A new construction trust to build the units of the new Borodinskiy-2 strip mine with 40 million tons of yearly coal capacity is to be established in Borodino in 1985. Eventually, the eastern wing of KATEK will produce 65 million tons of coal a year. [By A. Shcherbakov, IZVESTIYA correspondent] [Text] [Moscow IZVESTIYA in Russian 6 Jan 85 p 1] 12621

THINSEAM MACHINERY PRODUCED--Druzhkovka (Donetsk Oblast)--The Druzhkovskiy Machine Building Plant began to manufacture a new class of working face equipment designed to work thin coal seams. The first batch of such machines has been completed today. The series of units, designed by the Dongiprouglemash [Donetsk State Institute for Design of Coal Mining Machines] Institute in cooperation with the plant's engineers, has been tested in the Donbass mines and given high marks by the miners. Running in an automated mode, it recovers up to 900 tons of coal a day from a seam less than 1 m thick. This significantly exceeds the average yield from a longwall equipped with the previous equipment. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 23 Jan p 1] 12621

CSO: 1822/160

NON-NUCLEAR POWER

POWER-GENERATING POTENTIAL OF LESSER RIVERS DISCUSSED

Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 84 p 10

[Article by A. Dolmatov, candidate of technical sciences: "The Energy of Lesser Rivers", under the rubric "The Energy Program in Action"]

[Text] The most important condition for the realization of the USSR Power Program for the distant future is the practicing of economy in fuel and power-production resources, and making wide use of renewable energy sources. One of the trends in this affair is to build power stations on lesser rivers.

Until recently, the construction and operation of low-capacity hydroelectric power stations, the so-called small-scale GES's [MGES], were considered to be unprofitable ventures. The successes of large-scale power engineering and the development of expansive networks of power transmission lines and inexpensive electric power made many of the small-scale hydroelectric power stations which had been built in the pre- and post-war years, unprofitable.

The number of small-scale GES's from the 1930's to 1980 shrank from 7000 to 400. Production of their equipment was stopped, and the stations were shut down. In time, the abandoned dams and buildings went to ruin. It is notable that in 1965, when the most effective size, from a national economic point of view, for an economical USSR hydraulic power engineering potential was being defined, the resources of the lesser rivers were totally excluded. And a similar process took place in many other countries.

New investigations have shown the groundlessness of this concept. In the opinion of scientists, small-scale GES's can and must occupy a worthy place in electrical power production.

What exactly are small-scale hydroelectric power stations? Specialists relegate them to a classification of electric power stations having an installed capacity of from 100 to 30,000 kw. As an example, a 1000-kw MGES can provide a rural population center of 10,000 inhabitants, or a plant which produces 100,000 cubic meters of ferroconcrete structures per year, with electricity. A hydro-electric power station like this needs a supply of water having a flow rate of 10 cubic meters per second, and a head of 12 meters.

The small flood-control ponds, canals and reservoirs which are part of the MGES promote the development of irrigated farming agriculture, the fish farming industry, they improve the conditions of the rayon's water supply, and contribute to the establishment of workers' rest areas. In hard-to-reach northern regions, in the Far East, and in the high mountain villages of Central Asia and the Caucasus small-scale GES's can successfully replace the diesel power stations, whose diesel fuel consumption will soon grow to five million tons per year.

But in regions where the electric power supply is centralized and developed, the small-scale GES's could also be considered as a reliable reserve in emergency situations in the energy systems. We note that during the severe years of the war, it took only a few months to build these stations, and they successfully provided power to the industrial enterprises.

All of the hydroelectric power stations which are presently in operation in the European section of the country produce about 90 billion kw/hours per year, and save the national economy more than 35 million tons of standard fuel. The dimensions of the power-production potential of the small-scale GES's here is estimated to be just about exactly this amount.

Preliminary calculations show that capital investments for a kilowatt of installed capacity for small-scale GES's in the country's developed regions would not exceed 300-900 rubles, and the production cost for the electric power would not exceed 0.5-1 kopeck per kw/hour. This is in complete accordance with the criteria for national-economic effectiveness.

It is known that 50-70 percent of the cost for hydroelectric power stations is for the construction of water-retaining structures and reservoirs. Consequently, if either abandoned hydraulic power systems, or those which have been preserved are used, then small-scale GES's will be even more economical. An inspection of 31 of these hydrosystems in the Leningrad Oblast, for example, showed that 16 of them could be restored at minimal cost.

Over 1,250 irrigation and water-supply reservoirs have been built in the country, and many of them could be used profitably at the same time to produce inexpensive electric power. In the KiSSR alone, the power production potential of similar structures, both already built and planned, comes to two billion kw/hours per year. The further development of land reclamation, which was approved in the resolutions of the October 1984 CPSU Central Committee Plenum, will be associated with the widespread development of new irrigating reservoirs, a number of which can serve power production needs.

Of course the new small-scale GES's should be developed on a state-of-the-art technical level. These stations must be standardized, automated and operationally simple and reliable as far as possible. When constructing these stations, it is especially advantageous to use local soil materials, standard prefabricated construction buildings and large-block hydroelectric power station equipment.

That's for tomorrow. But how is the problem of small-scale GES's being solved today? On the recommendation of the GKNT [State USSR Council of Ministers Committee for Science and Technology], efforts are being made to find out the potential of effective lesser rivers, conceptual designs for GES headworks have been drawn up, and basic type sizes for hydraulic turbogenerator units have been specified. Technical assignments for developing turbine and generator equipment are being precisely defined and measures are being taken to inspect operating and abandoned hydraulic power systems and hydroeconomic facilities.

As we see it, very little has been done so far. For the most part, these efforts are being carried out on the minor initiative of a group of co-workers from the Gidroproyekt [possibly All-Union Order of Lenin Hydrotechnical Planning and Surveying, and Scientific Research Institute imeni S.Ya. Zhuk] associates.

On the one hand, it has been demonstrated that small-scale GES's are effective for the national economy. And on the other hand, for USSR Minenergo there's more advantage in erecting thermal electric power stations, the proportionate sectoral capital investments for which are considerably lower, and the outlays for the fuel-supply centers of which are provided by other departments. In this regard, it would be a good idea for USSR Gosplan to make an accurate determination of the assignments for putting the most economical small-scale GES's into operation. Continued underestimation of this problem, and the conditions which have come about for a departmental approach to its solution can only increase the extent of domestic small-scale hydroelectric power engineering's lag below the advanced international level.

It appears that local Councils of People's Deputies are going to have to play a major role in the development of networks of small-scale GES's. They can render invaluable assistance in the inspection of lesser rivers and reservoirs, and abandoned hydraulic power systems, and in the selection of primary construction projects. They can also take part in developing MGES's while simultaneously organizing the public services and amenities of their native krays. At first, the costs for checking and finishing designs will be offset, if USSR Minenergo get involved with small-scale GES construction. In the future, there will be more widespread carrying out of these efforts by local enterprises, as has been done previously, when the kolkhoz GES's were being developed.

The development of water power and power-production equipment is becoming an increasingly urgent problem, which needs to be resolved in the shortest possible time by Minenergomash [Ministry of Power Machine Building] and Minelektrotekhprom [Ministry of the Electrical Equipment Industry].

The widespread development of small-scale power production will promote a considerable saving in fuel and power production resources and will bring life to the Power Program.

12659
CSO: 1822/137

NON-NUCLEAR POWER

DEVELOPMENT OF MOSCOW CENTRAL HEAT SUPPLY SYSTEM

Moscow ENERGETIK in Russian No 11, Nov 84 pp 8-9

[Article by Candidate of Technical Sciences N. I. Serebryanikov and engineers V. A. Zakharov and Ye. K. Kuznetsov of REU Mosenergo: "Operational Experience and the Main Ways to Improve the Moscow Power Supply Central Heating System"]

[Text] The Moscow power system is distinguished by the high rate of growth of electric power which is provided through the more effective combined production of electric power and heat at heat and electric power plants.

During the past 20 years the level of central heating in Moscow (i.e., the share of the customer heat supply from TETs's[heat and electric power plants]) grew from 42 to 78 percent.

Mosenergo[Moscow Regional Administration of Power System Management] supplies heat to more than 43,000 residential buildings and 500 industrial enterprises of Moscow and Moscow Oblast. More than 2,500 km of main heating pipes as well as 22 large and more than 200 smaller transfer pumping stations are serving Teploset'[Moscow City Trust of Centralized Heat Supply Networks of the Mosenergo].

In accordance with a growth in the capacity of power sources, the further intensive development of heating systems is occurring--their length is increasing yearly by 80-100 km.

The central heat supply dimensions achieved permit the realization of great advantages which the combined production of electric power and heat yield. Today the Moscow centralized heat supply system saves four million tons of standard fuel a year or a tenth of the savings which the combined production of electric power and heat produces as a whole throughout the country.

The history of Moscow central heating covers 56 years. It began in 1928 when the first general-usage heating pipeline was laid from the experimental TETs VTI[All-Union Institute of Heat Engineering imeni F. E. Dzerzhinskiy] to a number of industrial enterprises. The start-up of the first central heating installations stimulated the further broad development of Moscow central heating.

The June plenum of the Central Committee of the VKP(b) [All-Union Communist Party (of Bolsheviks)], which took place in 1931 and examined the question of the Moscow city economy and the development of the USSR urban economy, had exceptionally important significance. A directive on the growth of Moscow's central heating was reflected in the future in decisions of the 17th (1934) and 18th(1939) party Congresses.

In the 1940's and 1950's, TETs's were constructed in the central part of the city. The construction began in 1960 of powerful TETs's situated on the outskirts of Moscow with the transmission of heat into the central areas over mainlines with a diameter up to 1,400 mm and a length of 25-30 km. Central heating equipment with PT-50-130, T-50-130, and T-100-130 turbo-units at initial steam parameters of 130 kilogram force per square centimeter and 565 degrees C has been installed at these TETs's.

The commissioning, beginning in 1971, of power blocks at supercritical steam parameters (240 kilogram force per square centimeter, 540 degrees C) with a 250-megawatt central heating turbine capacity has begun a new stage of technical progress in the area of the combined generation of electrical and thermal power. The thermal capacity of a block with two peak hot-water boilers of 180 gigacalories per hour each is 700 gigacalories per hour.

Compared with the T-100-130 turbine, the new unit has increased electric power generation for heat consumption by 20 percent and decreased specific fuel consumption during the condensation mode by 11 percent. The yearly consumption of standard fuel decreased by 40,000 tons; the national economic impact from using one T-250-240 turbo-unit reaches 4.5 million rubles a year.

Thirteen power blocks with T-250-240 turbines are now in operation in the Mosenergo system and their power exceeds 50 percent of the capacity of the Moscow TETs's. The average annual specific fuel consumption for all these blocks in 1983 was 233.7 grams per kilowatt hour and it was 218.4 grams per kilowatt hour for the TETs-23 blocks. The development of the Moscow central heating system in the 11th and 12th Five-Year Plans is based mainly on the further introduction of these economical units.

In the future, in connection with decreasing the use of organic fuel in the European zone of the country, the growth of central heating will be limited and it is planned to satisfy the requirements for heat by also increasing the capacity of operating TETs's with hot-water boilers.

Developments are being carried out for this which will permit a 1.5-fold increase in the discharge of heated water through the boiler unit of a 250-megawatt block; at the same time its central heating electrical capacity is growing by about five percent. Such a renovation, as well as the fuller loading of central heating take-offs during the heating season, must provide an annual standard fuel savings of more than 10,000 tons calculated for one unit.

Covering a heating load by installing additional hot-water boilers at a TETs is more advantageous from a national economic point of view than constructing new regional boiler houses.

With the aim of decreasing organic fuel consumption during the production of not only electric power but also heat, planning work is being conducted on developing in the future the Moscow heat supply from nuclear sources, and primarily from nuclear heat supply plants.

The replacement of operating equipment stock is an important factor in increasing power production effectiveness. Mosenergo is gradually replacing units with a steam pressure below 90 kilogram force per square centimeter, a depleted operating resource, with modern central heating power blocks with a capacity of 80-250 megawatts at a steam pressure of 130-240 kilogram force per square centimeter. Approximately a third of the fuel savings projected for the 11th Five-Year Plan will be obtained by replacing obsolete with modern equipment. The partial dismantling of generating equipment without replacement is specified at a number of TETs's. Boiler capacity at the same time will be preserved and it will begin working at lowered steam parameters for heat supply purposes.

One of the most important factors influencing the economy and reliability level of thermal power stations is their work schedule. It is determined by the load irregularity coefficient which is 0.65 for the OES/integrated power system/ of the Center of the country.

They have also begun to use heat and electric power plants along with condensation power plants to regulate the energy consumption schedule. At the same time electric power generation for heat consumption is being decreased at TETs's. Standard fuel overexpenditure in such a mode is about 100,000 tons during the heating season for Mosenergo alone.

The problem of using central heating equipment in a mobile condition is all the more important in connection with this. A work schedule for 250-megawatt central heat power blocks with a partial switching off of the regeneration system and the encircling of the system pre-heaters with water is being finished in Mosenergo.

Organizational work forms are also being improved along with the implementation of technical measures in the power system--the calculation and analysis of power enterprise work indicators are improving. The Mosenergo data computing center, in particular, is calculating on a monthly basis the normative standard fuel consumption for electric power and heat generation at energy system power plants.

Computer equipment is also being introduced right at the power plants. Thus, computers installed at one of the Moscow TETs's with 250-megawatt central heating blocks solve problems of calculating actual work indicators, assessing turbine conditions, controlling the effective mode of heating system individual units, analyzing emergency situations, and computing by shift the indicators used to sum up the competition of operational shifts.

The enlargement of TETs's and heating mainlines have sharply increased the requirement for heat supply reliability. Modern heating mainlines with 1200-1400 mm diameter pipelines, calculated on the discharge of 800-1100 gigacalories per hour of thermal power, transport heat for an area of the city with

a population of 200,000-300,000. Damage to such a mainline at any sector can lead to a lengthy disconnection of a large number of customers. A proper redundancy is necessary to prevent heat supply interruptions.

In accordance with earlier operating norms, heating mainlines from TETs's have been designed and built, as a rule, as radial, dead-end ones not connected with adjoining mainlines or other central heat supply sources. The design and construction of reserve connections began in the second half on the nineteen seventies.

The intention in the 12th Five-Year Plan is to modernize and build reserve heating system connections with a total length of 158 km, including 52 km in the center of the city. A ring of reserve connections will be constructed to provide reliability for the heat supply of the central part of Moscow.

Besides increasing reliability, the joining of heating systems also permits the solution of an economic problem--the most efficient allocation of a heating load among power plants with different steam parameters.

A significant impact can be obtained when operating on a total system of TETs's and city boiler houses. The hot water supply load of boiler houses is now being shifted to TETs's only in the summer period. The intention also is to shift these loads for a significant part of the heating system.

An increase in heat supply reliability also makes it necessary to sectionalize centralized heat collectors at large TETs's--to localize damages on individual mainlines and eliminate their influence on other power station heating pipes. Sectionalization is being carried out when designing new Moscow TETs's and renovating operating heating systems.

The work reliability of a heat supply system is determined to a significant degree by the quality of the structural solutions and the construction work. Unfortunately, the technical solutions made today when designing heating systems, construction practice, and low work quality lead to the fact that system service life does not exceed 15-20 years.

An increase in heating system pipeline diameters and the necessity to lay them under other engineering pipelines with intersections cause the heating route to be placed at a considerable depth in a ground water area. Therefore, the construction of drains should be completed at the same time as the construction of heating systems which prevents the flooding of the heating routes with water.

New structural solutions and the use of progressive materials in the construction of heating systems, which would extend the service life of heat pipes up to 80-100 years, are necessary; they must be guaranteed to be waterproof when they are in damp surroundings, to have insignificant heat losses, and be provided with a control system to detect any damages at the initial stage.

It is advisable to introduce a heating pipe design using polyethylene tubes as anti-corrosion protection and polyurethane for thermal insulation with a remote system controlling the tightness of pipes and the absence of insulation dampening. The construction of such heating pipes will permit the use of the non-channel and non-support method of laying them, will significantly decrease supply-line water leakages and heating losses, and will lower heating system construction costs and operational expenditures. The experience in operating similar structures abroad bears out their high reliability and economy.

More than 15 percent of the operating mainline heating pipes need to be replaced. More than 2,000 unreliable sections surface and are replaced annually in the heating season preparation period. Nevertheless, about 800 breakages occur during the season.

A sharp increase in the volumes for re-laying obsolete systems (up to 80-100 km a year), which requires amortization allowance operating norm changes for capital repair and the strengthening of construction and repair organizations, is necessary. With this in mind, a specialized enterprise for the repair of heating systems--Mosteploset'energoremont/Moscow Enterprise for the Repair of Heating Systems in Power Plants/ was created in 1981 in Mosenergo.

A central restoration service was created and is functioning in Teploset' and emergency restoration crews on duty around-the-clock are working in operating areas. Regional emergency restoration service branches in various sectors of the city, fitted out with the necessary equipment, are being organized to increase operational efficiency and decrease the time for ending heating system damages.

The installation of new pipes with durable corrosion-resistant coating is advisable when repairing and replacing pipelines. For this aim a special exterior pipe-enameling shop, which will be put into operation in the 11th Five-Year Plan, is being built in Mosenergo.

The reliable and economic operation of a complex central heating system is impossible without a flexible dispatcher operations control system, the automation of the work schedule of its individual parts, and telemechanics and remote control by production equipment. A two-stage dispatcher control system has been organized in Teploset'--the Moscow central dispatcher point is connected with the 12 regional dispatcher points and they, in turn, with the TETs's and transfer pumping stations.

However, the level of remote control equipment is inadequate at present. Heating mainlines are not equipped with devices transmitting the heat carrier parameter readings to the dispatcher points which does not make it possible to take measures to uncover and localize breaks in a timely manner. An increase in the control level is being realized by the step-by-step introduction of an ASU/automated control system/ into the Moscow central heating system.

8524
CSO: 1822/142

NON-NUCLEAR POWER

BRIEFS

KHABAROVSK-KOMSOMOLSK-NA-AMURE LEP DONE--Komolsk-na-Amure--The standard deadlines for erection of the Khabarovsk-Komsomolsk-na-Amure LEP-500 [power transmission line] has been reduced 3-fold. It took only 11 months in all for the heavy-duty power bridge, which is almost 400 km long, to cross the taiga, the cone-shaped hills and swamps. The shock work was accomplished by power engineering workers, installers and pilots who were not only from the Khabarovsk Kray, but also other oblasts of the Far East and Siberia, as well as from around Moscow. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 28 Dec 84 p 1] 12659

CHEBOKSARSKAYA GES INCREASES CAPACITIES--Cheboksary (TASS)--Today the 15th unit was put under industrial load at the Cheboksarskaya GES [Hydroelectric Power Station]. The intensive start-up time-table underwent a 2-fold reduction. The experience accrued by the installers during installation of previous units and innovations introduced into the assembly procedure, were helpful. With the start-up of all 18 of the GES's units, the station's capacity amounts to 1.4 million kw. [Text] [Moscow PRAVDA in Russian 1 Jan 85 p 2] 12659

EKIBASTUZSKAYA GRES-1 INCREASES CAPACITY--The last power block of the Ekibastuzskaya GRES-1 has been put on stream. The design output of the power station is 4 million kw. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 1, Jan 85 p 2] 12659

TURKMEN GRES' OUTPUT CITED--Mary--At present, this flagship (the Maryskaya GRES imeni 50th Anniversary of the USSR) of Turkmeniya's power production is producing more than 80 percent of the republic's total electric power. A high-capacity LEP [power transmission line] carrying voltages of 220,000 and 500,000 volts has connected the station with Ashkhabad and the unified Central Asia power production ring. Every day six units having an overall capacity of 1,000,260 kw produce over 20 million kw/hours. Natural gas from Shatlyk and water from the Kara-Kum canal make possible here the production of one of the cheapest forms of energy for thermal power stations in the country. [By V. Rashkevich] [Excerpt] [Moscow IZVESTIYA in Russian 20 Nov 84 p 1] 12659

TURBOGENERATOR PILOT MODELS COMPLETED--Leningrad--An 800,000-kw-capacity turbogenerator, tests of which were completed yesterday at the Elektrosila Association in Leningrad, is distinguished by the reduced amount of metal used in its manufacture and by its high efficiency. With the manufacture of this machine, the scientists of the city on the Neva, working with production workers, have completed development of the pilot models of a unified series of standardized turbogenerators. The series consists of seven unit models having capacities of from 63,000 to 800,000 kw. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian, 5 Jan 85 p 1] 12659

YAROSLAVSKAYA TETS BEING GASIFIED--Yaroslavl--The power-producing heart of the Yaroslavskava TETs-1 [Heat and Electric Power Station], one of the first domestic heat and electric power stations, has been beating for half a century. And even though there are more powerful and technically improved central heating and power plants in the city, the importance of this veteran in Yaroslavl power production is in no way diminished. And today this TETs supplies power to 14 major enterprises and supplies heat and light to the apartments of 160 thousand city dwellers. By using economic operating schedules and by introducing new equipment, the collective succeeded in reducing relative outlays of standard fuel during the 11th Five-Year Plan period. Until recently TETs-1 operated on peat, which is now being replaced by natural gas. The reconstruction connected with this will be completed at the end of 1985. Tens of thousands of tons of valuable fertilizer will be made available for agricultural needs. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 1, Jan 85 p 15 12659

NOVOCHEBOKSARSK TETS-3 GASIFIED--Novocheboksarsk (Chuvash ASSR)--Urengoy gas has been delivered to Novocheboksarsk: TETs-3, which supplies this young city on the Volga with heat, has been converted from fuel oil to gas. The gas pipeline to Novocheboksarsk was laid in compressed periods of time by the builders of the Urengoy-Pomary-Uzhgorod main, which they laid through the Chuvash region. A powerful automated gas-distributing station was recently installed and TETs-3 has been rebuilt. The conversion of the central heating and power plant to natural gas will permit an improvement in its operational reliability and economy, and will make the air basin in this rayon more healthy. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 11 Dec 84 p 1] 12659

ELEKTROSILA PRODUCES NEW TURBOGENERATOR--Leningrad--Assembly of an 800 thousand-kw capacity turbogenerator was completed today by the Elektrosila Association. This machine is 15 tons lighter than its predecessors, and has a higher efficiency rating. With the manufacture of this machine, the enterprise collective has completed the development of the pilot models for a unified standardized series of turbogenerators. [Text] [Baku VYSHKA in Russian 5 Dec 84 p 1] 12659

PRUT HYDRAULIC DEVELOPMENT OPERATIVE--Kishinev--The Kosteshty-Stynka hydraulic development has been put into permanent operation by Soviet and Romanian construction workers on the border river Prut. A dam about 50 meters high has partitioned off the river, and has formed a water reservoir with a capacity of over a billion and a half cubic meters. Units of a hydroelectric

power station which will be supplying power for the national economies of two countries have been installed here. This hydraulic engineering complex will make it possible to irrigate 140,000 hectares of land and will improve the water supply for dozens of population centers and will improve the navigability of the Upper Prut. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 14 Dec 84 p 1] 12659

BELGOROD POWER LINE DOWNED--As has already been reported, during the night of 10 January, one of the high-voltage lines which supply power to the entire southeastern part of Belgorod Oblast parted due to severe icing. A large section of the regional and local power networks was also disrupted. The power supply for population centers of industrial enterprises, kolkhozes and sovkhozes in nine of the oblast's rayons was disrupted or completely shut down. The entire population rose up in the struggle with the elements. No one could even imagine what the unexpected post-new-year thaw would turn into: instead of the expected cold spell, it rained and then wet snow fell. Icing appeared on the LEP [power transmission line] supports and wires, and quickly turned into a thick, heavy incrustation. Specialists calculate that at that point there were additional loads of 10-12 tons on each LEP support. The strong wind completed what had been begun by rain and frost. Not bearing the burden, the wires broke, and the supports broke from underneath them and fell to the ground. [By A. Protsenko, SOVETSKAYA ROSSIYA special correspondent] [Excerpts] [Moscow SOVETSKAYA ROSSIYA in Russian 17 Jan 85 p 2] 12659

CENTRAL ASIAN LEP PROGRESSING--Alma-Ata (KazTAG)--Work on connecting the united power system of the Central Asian republics and Southern Kazakhstan to the country's united power system is entering the final stage. The first 300-km section of the Alma-Ata--Agadyr LEP-500, which will unite these major power engineering regions, was set up for operating tension months ahead of schedule. A lot of time was saved through the cooperation of the right-of-way builders with the collective workers of the Energostroyindustriya [possibly Industrial Power Construction] Association, which is part of the Uzbekgidrostroy [possibly Uzbekistan Hydraulic Engineering] Trust which organized production of supports of a novel design. And installation workers of the Sredazelektroset'stroy [possibly Central Asian Electric Power Network Construction] Trust, in its turn, organized the universal equipping for their rapid assembly and hoisting. Unification of these power systems by an electric span which will be completely operational in 1986 will give complete coverage for the maximum daily loads in the networks of the European section of the country, and Central Asia and Kazakhstan, and will improve the reliability of the power supply to industrial enterprises and the facilities of the agricultural-industrial complex. The intense electrification of the republic continues. Over 16,000 km of high-voltage LEP's have been installed since the beginning of the five-year plan period. [Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 5 Jan 85 p 1]12659

LEP UNITES POWER STATIONS--Stavropolskiy Kray--Commercial operation of the LEP-500 which has united the Inguri GES with the Stavropolskaya GRES has begun. Its overall length is 617 km. [By V. Pankratov, PRAVDA correspondent] [Excerpt] [Moscow PRAVDA in Russian 16 Dec 84 p 1] 12659

CSO: 1822/137

PIPELINE CONSTRUCTION

PROGRESS REPORT ON NEW USSR-FINNISH GAS PIPELINE

LD081542 Moscow TASS in English 1453 GMT 8 Apr 85

[Text] Moscow, April 8, TASS--A new gas pipeline whose construction has been started in Finland by Soviet specialists will permit to more than double the deliveries of Soviet gas to that country.

A TASS correspondent has been told at the USSR Ministry of the Oil and Gas Industry Construction that the new 250-km-long gas pipeline connecting Kouvola, Helsinki and tampere is laid in accordance with the contracts signed by Soviet and Finnish state organizations. As a result of it, in the coming five-year plan period (1986-1990) the deliveries of Soviet natural gas to Finland will reach 7.7 billion cubic metres.

In 1972-1973 Soviet builders laid the 161-km-long pipeline connecting the border, Kouvola and Kotka. At the same time, a pipeline from Leningrad to the border was built.

This gas pipeline system has been designed by Finnish specialists. They will deliver pipes and equipment for it, will carry out earth-moving operations and will build settlements for construction workers.

The USSR dispatched to Finland a group of builders with an extensive experience of laying pipelines, including the construction in the extremely difficult conditions of Siberia of the export gas pipeline connecting Urengoy and western Europe. In Finland builders will face serious difficulties: the pipeline will pass through the rugged terrain, rocks and boggy areas.

It is planned to finish the construction in late 1986.

CSO: 1812/207

ENERGY CONSERVATION

STATUS OF ENERGY CONSERVATION MEASURES IN MOSCOW REGION

Moscow LENINSKOYE ZNAMYA in Russian 14 Dec 84 p 1

[Editorial, author not specified: "To Save Energy Resources"]

[Text] The time of fall and winter peak electrical loads entails an increase in the consumption of fuel resources. For example, the consumption of natural gas for heating during this time more than doubles. The electrical system is working hard, particularly at peak use times. Power engineers are taking steps to better supply consumers with resources: they maintain the capacity of working stations at the necessary level, look after the reliable functioning of equipment, devote increased attention to saving fuel and making the energy produced more inexpensive...

Power engineering in the Moscow region possesses a mighty base and its potential continues to grow. Equipment is being updated and modernized; modern heat-producing turbines, highly economical power units, a new model of gas turbine installations, heat-recovery units and much more are being put into production. A program to replace outdated equipment at TETs #6 in Orekhovo-Zuevo is being implemented and the Stupinskaya TETs is in the process of being rebuilt. At this latter, new boilers and other capacities are going into operation. Near Zagorsk the most powerful water accumulation electric power station in the USSR is under construction.

Simultaneously with the building up of power engineering capacities the electrical network itself is undergoing development. Over the summer months it was completely readied for service.

However, despite the high degree of energy preparedness, during the fall and winter peak period there still arise difficulties in the supplying of consumers with heat and electricity. Shortfalls in capacity appear. Can this be avoided? It is felt that close cooperation between the subdivisions which produce energy and industrial, construction, transport and other enterprises and organizations would allow us to winter with fewer losses. The basis of such cooperation is economical utilization of resources and strict observance of a system for the production and consumption of electricity and heat.

The situation demands thrift in all areas, and in the zealous utilization of fuel and energy resources in particular. However, to this very day inertia tenaciously persists in our way of thinking: look, we say, our country is rich in coal, petroleum and natural gas! But we must take this wealth and use it prudently and intelligently.

This is why so much attention has been devoted recently to reducing the production cost of an important item of expenditure: power capacity. Proceeding from all of this one can conclude that an energy-saving national economic policy is an indispensable criterion for further successes in the Soviet economy.

In his speech before a CPSU Central Committee Politburo session, Comrade K. U. Chernenko noted that our approach to economy must now be a fundamentally different one. The situation has changed, and we must not count on constant growth of resources.

In 1985 the additional demands of the national economy for fuel and energy resources must be met by almost 60 percent through economy and conservation. Such is the task posed by the Party. In order to fulfill it each enterprise and each consumer must draw up an accurate and specific plan of conservation measures: from the working out of sound consumption quotas to strict measures of control of the fulfillment of assignments and obligations undertaken.

At the present time socialist obligations for the new year are being drawn up in all sectors of industry in the Moscow region. One of the main points therein is resource conservation. Many oblast collectives are setting themselves the task of working for two days this year on supplies, raw materials, fuel and energy which were saved through conservation. Specifically, Orekhovsk textile workers announced such obligations, and Kupavna cloth factory workers and other collectives followed their example. Lyubertsy carpet makers have already accumulated a one and a half days' resource reserve, and for next year they are preparing to achieve such a reserve for no less than two days' work.

The collective of the Dulevskiy Porcelain Plant has pledged to conserve 200 tons of raw materials, 120,000 kilowatt-hours of electric power and 100 tons of standard fuel in 1985. This will be enough to manufacture products for two days. One could present quite a few such examples of prudent management in the upcoming year.

Similar opportunities are available in practically every labor collective. The final quarter of the year is the time for releasing funds to consumers for energy resources. This is also the time to prepare the requisite technical and economic bases for undertaking ambitious obligations for next year. In preparing them, collectives at the same time analyze their achievements in the current year. It must be said that not all of them succeeded in utilizing their resources efficiently. For example, the results of oblast industrial enterprises' competition to conserve electric power in the third quarter bear this out, although as a whole industry in the Moscow region conserved 62 million kilowatt-hours of electricity.

Leading collectives in the competition are those of: the Mosasbotermsteklo, Mosstroyplastmass, Kolomenskiy Plant and Klin Termopribor Production Associations; the Ramenskoye Instrument Building, Dorokhovo Glass, Zaprudnya Electrovacuum Instruments and Podol'sk Chemical and Metallurgical Plants; and the Kuchinsk Ceramic-Lined Materials, Elektrogorsk Furniture, Pushkino Bread and Zagorsk Refrigeration Combines, and others. Many of them were awarded special privileges. Savings did not just happen to them, they did not fall like manna from heaven. This was the result of a persistent technical search, worker initiative,

and a feeling of great responsibility on the part of each worker in the collective. The organizational aspect of the matter is also of considerable importance. For example, much work is being done in connection with the replacement of power-consuming equipment. An important aid in monitoring the utilization of energy resources is the issuance of monthly limits on capacity of and consumption by each shop.

Unfortunately, such zealousness has not yet become the rule for many labor collectives. In the third quarter the production association for industrial fabrics in Krasnoarmeysk, the Voskresensktsement Production Association and others permitted overconsumption, violation of electricity consumption schedules and poor management.

What do these facts say? They speak of a fundamental lack of discipline and the absence of the necessary order in the operations of main power engineers.

Such a form of hidden waste as the achieving of savings in fuel and energy resources as compared to announced quotas without their corresponding reinforcement by specific organizational and technical measures deserves criticism. Flexible quotas and limits create a carefree life for such collectives. This sort of sham economy is of no use to anyone. In allocating funds ministries and departments must proceed upon the actual requirements of subdepartmental collectives.

Wherever energy-saving techniques and technology are a priority, wherever work is unthinkable without production schedules, wherever good accounting for and control over fuel and energy consumption have been established, wherever, finally, painstaking work is being conducted to fulfill obligations undertaken on the engineering, organizational and ideological levels: there there is order and the channels for losses are closed.

Practice confirms that in the Moscow region there are collectives which could do more than two days' work in the course of a year on resources saved through conservation. Gorkoms and raykoms must devote attention to this fact in the period when obligations are being worked out and defended, and demand that goals proposed be ambitious.

Managers of enterprises and organizations must achieve clear-cut discipline in the observance of wintertime energy consumption plans. In the interests of all it would be right for shops to find possibilities for making maximum use of equipment at night.

Rayon and city interdepartmental and industry commissions and organs of energy and natural gas supervision should take the observance of daily and monthly limits during the winter period under firm control. Jointly with permanent commissions in local soviets, delegate groups, organs of people's control and the Komsomol Searchlight they should organize mass surprise inspections. Particular attention should be devoted to setting standards, establishing an accounting for and monitoring of resources and persistently attempting to achieve the effective elimination of those shortcomings which are uncovered.

12825
CSO: 1822/140

ENERGY CONSERVATION

USSR COMMISSIONS MEET IN JOINT SESSION ON ENERGY

Moscow SOVETY NARODNYKH DEPUTATOV in Russian No 11, Nov 84 p 69

[Article, author not specified: "Energy: To Produce More, To Conserve Better"]

[Text] The matter of the work of the USSR Ministry of Power and Electrification [Minenergo] to increase the efficiency of energy capacity utilization and energy resource conservation was discussed at a joint session of the USSR Supreme Soviet Council of the Union and Council of Nationalities commissions on energy and commissions on science and technology. The session was held in the Kremlin. Commission executives L. A. Gorshkov, I. A. Glebov, E. P. Velikhov and V. A. Kotel'nikov chaired the session. P. S. Neprozhniy, USSR minister of power andelectrification, and B. V. Kachura, secretary of the Ukrainian CP Central Committee, who headed up the joint preparatory commission of delegates, presented reports.

Our power engineers have quite a few achievements to their credit. In accordance with the decisions of the 26th Party Congress, subsequent CPSU Central Committee Plenums and the USSR Energy Program major steps are being taken toward the further all-round development of electric power engineering and central heating. The Unified Electric System, the world's largest, operates in our country, and its successful parallel functioning with the electrical systems of CEMA member nations is being realized. Operational capacity at USSR Minenergo electric power stations increased by 25.8 million kilowatts during the current five-year plan; total capacity is presently 261.6 million kilowatts.

Successes are successes, but the swiftly developing national economy requires an ever greater quantity of electric and thermal energy. This forces us to evaluate more strictly the work of Minenergo. Speaking in the discussions, B. A. Arbuzov, M. I. Boltunov, P. M. Noreyka, B. P. Tolstykh and other comrades, without belittling power engineers' achievements, at the same time justifiably called attention to the fact that the level of work to increase the effectiveness of energy capacity utilization and energy resource conservation conducted in the workplace by the ministry and its organs still does not meet Party specifications. Often limitations are introduced and enterprises, associations, kolkhozes and sovkhozes are sometimes cut off from power supply centers. New production capacity is needed, but capital funds allocated for the construction of electric power stations are utilized poorly.

Such a state of affairs is explained in large part by the fact that USSR Minenergo continues the practice of dispersing capital investments and including a significant

number of new construction projects in annual plans, without having first fully guaranteed the financing of projects under construction and highly important projects. In addition, the level of job organization and labor and production discipline at projects under construction is extremely low. Losses of work time are great. Insufficient attention is devoted to giving cadres advanced training and creating appropriate social and everyday conditions for them. Plan goals for the completion of apartment houses and other projects for social and everyday purposes are not being fulfilled.

Members of the commissions also devoted attention to the fact that on a number of points other ministries and departments are aggravating the situation with regard to the production and conservation of electric power. Thus, the USSR Ministry of the Coal Industry has long been attempting to resolve the matter of increasing the quality of coal supplied to electric power stations. Machine builders are not fulfilling plans for the production of individual types of equipment. The Ministry of Instrument Making, Automation Equipment and Control Systems is slow in developing the production of automated systems and instruments for accounting for and monitoring fuel and electric and thermal energy. At the same time numerous counts of bad management and wasteful energy consumption are taking place in sectors of the national economy.

In the commissions' decision it was recommended to USSR Minenergo that effective measures be taken to eliminate the shortcomings indicated. The attention of Minenergo, the appropriate ministries and departments and local soviets of people's delegates was directed to the necessity for enterprises and organizations to prepare on time for work under winter conditions.

The commissions deemed it necessary to request the USSR Supreme Soviet Presidium to recommend to union republic Supreme Soviet Presidiums that they increase control on the part of local soviets of people's delegates, in accordance with the powers granted to them, over activity by enterprises and organizations to increase the efficiency of energy capacity utilization and conservation of fuel and energy resources and over the carrying out of legal requirements pertaining to the construction of energy projects in combination with housing and projects designed for social, everyday and cultural purposes.

USSR Minenergo, USSR Gosplan and other USSR ministries and departments concerned are urged to examine the commissions' decision and report by 1 December 1985 on measures taken.

Taking part in the work of the commissions were: B. A. Ashimov and A. F. Vatchenko, deputy chairmen of the USSR Supreme Soviet, L. N. Tolkunov and A. E. Voss, chairmen of the USSR Supreme Soviet Chambers, T. N. Menteshashvili, secretary of the USSR Supreme Soviet Presidium, A. M. Shkol'nikov, chairman of the USSR People's Control Committee, and the directors of a number of ministries and departments.

12825
CSO: 1822/140

ENERGY CONSERVATION

ILLEGAL DIVERSION OF ELECTRICITY IS WIDESPREAD

Moscow IZVESTIYA in Russian 21 Feb 85 p 3

[Article by V. Scherban', IZVESTIYA correspondent in Simferopol and Moscow under the rubic "Who 'Abducted' DenproGES?" "We Present a Bill to Fans of Free Electricity"]

> [Text] I read numerous summaries and at times I can hardly believe that the matter has acquired such proportions. The embezzlements total millions of rubles. The details are astonishing. People "steal" without leaving their own homes, with clean hands so to speak. In this affair there are also lists of those who have been caught red-handed. All of them are accused of misappropriating ...electricity.

The witness: Vladimir Nikolayevich Belousov, deputy chief state inspector of the USSR for energy supervision.

"Last year, our specialists made over 120,000 spot checks. Their results showed that the misappropriation of electricity has sharply increased during the last 2 years. Enormous losses are occurring in the south of the country. In Uzbekistan, 14,800 homes and apartments have been found where electricity was being used for free, as well as 10,500 in Georgia and almost 5,000 apartments in Moldavia."

"What is the total figure for embezzlements in the private sector in a year?" An intense look at the correspondent. "A billion kilowatt-hours a year. Moldavia could run for a month and a half on this amount of energy."

"Just what is the problem here? We made inquiries and found out that the majority of the warm republics were quite inadequately supplied with fuel. And this means that as soon as the cold weather arrives, powerful heaters are turned on in the apartments. They are all gluttonous." However, it won't do to ascribe everything to the cold weather. A freezing winter only illuminates more clearly just how far matters have gone in the stealing of electricity in general. In the past year alone,

17 million rubles in fines have been exacted from private persons. This is the only method of punishment. No matter how paradoxical it might sound, by law the stealing of electricity is not embezzlement."

"You asked me to name an area with a difficult situation? Go the the Crimea," advises Belousov.

And so, to the sunny peninsula. It's winter. D. Il'nitskiy, boss of the energy supervision service of the Simferopol enterprise of power networks, tells me the following: "They plunder enough electricity in a year for all the industry of the Crimea to operate for 24 hours. Our inspectors are constantly taking part in rai!s. They exposed 76 instances of embezzlement in just 2 days: 5 at enterprises and 71 in the private sector. For example, a malicious plunderer was found in Sevastopol. He was fined 9,750 rubles."

Material evidence. S. Chernyavskiy, director of Krymenergonddzor, soon returned from a riad and showed me an unusual "collection." In it were instruments for stealing electricity. They ranged from primitive groundings and jumpers to complicated systems using integrated circuits and electronic deception devices capable of turning meter disks backwards at enormous speed. The "trophies" (there were more than a hundred) were obtained in the course of one month of raids.

At the "scene of the crime." We drive out on the raid with our headlights on. The working day has ended. Consequently, the local "Edisons" should be home.

Inspector Nikolay Babakayevich Gabay is next to me in the bus. He has 40 years of service. I was told that he had something like a "sixth sense." He recognizes right off the bat those who are stealing electricity. While enroute, we divide into groups. Each group will "comb" 10 to 12 houses on the route. Gabay and I are working as a pair today.

We have arrived. The inspector immediately points the nearest house out to me. The lights in the windows go out right in front of our eyes. The inspector jumps out of the vehicle. We must hurry.

No one answers the bell although we can clearly hear muffled voices behing the door. At last it opens slightly. "Who do you want to see?" The inspector shows his credentials.

The first thing we do is examine the meter. All the seals are in place. The glass is not forced out. There is irony on the face of the apartment's owner; as if to say, go ahead, look. A visual search won't show anything. But at this point, Gabay pulls out a "juice detector", an instrument with a small antenna, and puts on the headphones. He slowly sweeps the antenna along the wall. He goes a couple of steps and stops suddenly and pulls off the headphones. Now even I can hear the weak crackle. The woman of the house begins to tug at her apron in agitation. Her spouse pales noticably. Everyone tensely watches the inspector.

The woman begins to fidget. "Dear guests," she says trying to save the situation, "I've just laid the table..." She is cut off in mid sentence.

The inspector turns around abruptly and says: "Look." I peer closely. In the spot towards which he had pointed, a barely noticeable button the size of a match head protrudes from the wall. It has been colored to match the wallpaper.

"The button of a solenoid", explains Gabay. "With its assistance, the juice flows past the meter." "I'll show you." He presses the button. A click and the meter freezes. It seems to me that the click caused the owner to come to his senses, since he abruptly moved to the door, blocking the exit.

"Tear up the report!" The words are forced out in a toneless voice. He has reason to be upset. Deceiving the state, this "big shot" was heating his own greenhouse free of charge.

We wrote up three more reports in the next eight buildings.

The bribe. The last house sticks in my memory especially. A German shepherd raged behind a fence two meters high. No one answered our call, although we knew that the owners were home. Somebody's shadow was distincly visible behind the blinds. But the door didn't open right away. A sweet, female voice called out: "Welcome!" [literally, "We beg for mercy!"] "Obviously, there is reason to beg", noted the inspector.

The "juice detector" was turned on. We passed through the kitchen, one room, then another. It was quiet in the headphones. A rug hung on one of the walls. The inspector stopped. "There is something here", he said and nodded. The bottom of the rug was thrown across the back of the sofa. I reached out to raise the edge, but the strong fingers of the owner squeezed my hand.

"It's not yours, don't touch it!" he was about to say, but Gabay himself threw back the rug and we saw two hidden sockets. Wires extended from them. One led into the workshop, another to a household saw frame, and a third led into the shower. Was was boiling there in a barrel.

The inspector began to write out a report. "Cut the clowning." This is for your troubles", said the owner and held out two 100-ruble notes.

We managed to finish writing the report only after a row.

Instead of an "indictment". I was on a night flight. The stewardess brought a sip of soda in a plastic glass and informed me: "We are flying over DneproGes." I looked out the window. Below was a sea of lights. This involuntarily brought to mind the "kilowatt hunters," who, if you sum it all up, had just about stolen DenproGES. More precisely, they had stolen the quantity of electricity produced by it in three months!

In this article we have acquainted you with malicious "electricity thieves." However, we had occasion to meet others in the raids as well. No, the activities of those who attempt to deceive the state unquestionably need to be suppressed. Hundreds of inspectors are engaged in this. But among those fined were people for whom I was genuinely sorry. They committed violations, as they say, not with good intentions. What is it I have in mind? In many apartments I had occasion to find various heating apparatuses which consume a "cloud" of electricity; some purchased, some home-made. They "twist" the meter to a degree where payment for electricity becomes a problem because, alas, it is cold in the buildings. For a successful struggle with thefts of electricity (specialists are unanimous on this) it is necessary to fix the normal heat supply in apartment buildings.

A different attitude should be taken towards the "big shots", and they are much more numerous, who cunningly reduce the cost of a hothouse cucumber with free electricity. It must be supposed that the reduction of the cost of the product does not influence its market price. Stolen kilowatt-hours, having become embodied in early vegetables, themselves become a good and subsequently ready money accumulating in old-fashioned money boxes and pass books.

What grabs your attention in this story is the impunity of those who steal electricity on "an especially large scale." Fines? These are a drop in the ocean by comparison with the value of electricity stolen over many years. Nevertheless, these people are not scared. They are convinced that they are threatened with nothing except fines. Doesn't their "bravery" cost society dearly?

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GENERAL

LUKIN SAYS FUEL-ENERGY BASE MUST EXPAND

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 22 Dec 84 p 2

[Article by USSR Deputy Minister of Power and Electrification V. Lukin: "The Strategy of Economy"]

[Text] The power industry is the largest consumer of coal, gas and petroleum products. More than half of the boiler and furnace fuel consumed in the country is now spent on the production of electricity and heat. It's necessary to take into account in this situation that the further development of the national economy demands a constant expansion of the output of electricity, which in turn will cause an increase in levels of fuel consumption which are already enormous. Meanwhile, the production and delivery of fuel is becoming more expensive with every passing year. In addition, reserves of natural resources are limited.

In the situation which has arisen, the necessity of an economical attitude towards fuel resources moves to the forefront. As comrade K. U. Chernenko emphasized in his speech at a meeting of the Politburo of the CPSU Central Committee on 15 November of this year, now "it is precisely economy which is becoming the most important source of maintenance of growth in production."

The accelerated development of the nuclear power industry envisioned by the Power program is one of the most important trends in allowing us to sharply reduce the consumption of scarce organic fuel. For the time being, nuclear power plants still produce a comparatively small portion of the electricity produced in this country. Out of 1.465 trillion kilowatt hours, AES's now produce about 137 billion. But their contribution is growing rapidly. This year alone the generation of electricity using nuclear fuel will grow by almost a quarter. Operating nuclear giants will save the national economy 50 million tons of conventional fuel.

This is the way the task is set up: to provide practically the entire increase in generation of electricity in the European part of the country in the immediate future as a result of development of nuclear power generation. This will allow us to save a significant quantity of organic fuel, which can then be directed to other needs.

The problem of reducing the expenditure of fuel in the generation of electricity in our traditional electric power plants, those working on

organic fuels, has become acute. At present, these primary "factories of electricity" produce about 75 percent of all electrical power generated. The electric power plants working on organic fuels of the USSR Ministry of Power and Electrification require more than 460 million tons of conventional fuel yearly. A reduction of its specific consumption by just one gram [per kilowatt hour] creates an opportunity to save up to one million tons of conventional fuel a year.

It's necessary to say directly that there are still great reserves here. Although at present in the ministry as a whole, in comparison with last year, the consumption of fuel has been reduced by 1.4-1.5 grams per kilowatt hour, a number of our electric power plants did not fulfill the established task of reducing the specific consumption of fuel. Among them are the Troitskaya, Novocherkasskaya and Primorskaya GRES's, the TETs-20 Mosenergo, the Irkutskaya TETs-10 and others.

The appreciable "scattering" of indices of economy of power-generating enterprises fitted out with equipment of the same kind and consuming the same type of fuel, cannot fail to cause concern. For example, at the Reftinskaya GRES, which uses Ekibastuz coal, power-generating units with a capacity of 300 megawatts expend 331 grams of fuel to produce one kilowatt-hour. But at the Troitskaya and Yermakovskaya plants, which use the very same coal, power units of the same type have a specific expenditure of more than 360 grams. A similar situation exists among plants which use fuel oil. The leading collective of the Kostromskaya GRES uses 316 grams of fuel to produce a kilowatt-hour of electricity, when, for example, at the Syrdar'inskaya GRES this indicator is equal to 363 grams.

Hence it is possible to make the following inference: the technically literate exploitation of equipment, a high quality of repairs, and strict observance of regulations and standards are an important reserve of fuel economy. Therefore, the comprehensive strengthening of technological discipline, raising the qualification and accountability of personnel, and wide dissemination of the experience of the best [collectives], remains one of the most important tasks.

However, the calculations of specialists show that it is possible to achieve decisive success by means of scientific-technical progress. Much in this direction has already been done. Fuel-fired power plants are being equipped with large generating units having capacities of 300, 500 and 800 megawatts. The unique 1.2 million kilowatt unit at the Kostromskaya GRES is being successfully mastered. The program of plant modernization of the industry developed by the ministry envisions the removal from service and dismantling of obsolete, uneconomical equipment. We intend to obtain substantial economies as a result of renovation and modernization of operating equipment.

The paramount importance of this work for raising the economic effectiveness of the power industry, places on the agenda the problem of accelerating rates of plant modernization and renovation of the industry. For the time being, they are clearly insufficient: we manage to replace less than one

percent of the obsolete and worn-out stock of units per year. At many fuel-fired power plants, electricity is still being generated by uneconomical equipment. The specific expenditure of fuel there exceeds the industry average by almost 1.5 times. It's necessary to put an end to such squandering as quickly as possible.

The further development of the system of district heating plants is an important trend in the more effective utilization of fuel. We save 25 million tons of equivalent fuel yearly as a result of cogeneration of electricity and heat. We are planning on bringing on line in the new year extraction turbines operating on high and supercritical steam pressure with a total capacity of 3.4 million kikowatts.

Along with this, a situation frequently arises where the expansion of power-and-heat generation capacities is artificially constrained by a lag in tieing-in to consumers of heat; by an insufficient volume of construction of municipal heating systems. To put it bluntly, at times it turns out that there is no place to send the heat. Obviously, Gosplan USSR and local planning organs need to more efficiently coordinate the times of link-up of sources and consumers of heat and calculate the demand more precisely.

Losses of heat, and therefore, of scarce fuel as well, are intolerably large in heating main systems. The service life of thermal-insulating structures manufactured by the enterprises of the Ministry of Industrial Construction is short. The industry is now working on the development of a new thermal-insulating material--foam polymer concrete. We hope that in the next few years we will be able to provide a reliable "fur coat" to the heating mains.

The reorientation of the fuel balance of electric power plants, which is directed towards the further reduction of the expenditure of boiler oil and an increase in the use of gas, plentiful coals and shales, has been occasioned first and foremost by considerations of fuel economy. This year, gas distribution systems to 17 electric power plants have been brought on line. Natural gas has been delivered to such large GRES's as the Stavropol'skaya, Konakovskaya, Kostromskaya and Ryazanskaya. This will allow us to free more than 6 million tons of fuel oil for other needs.

The economic indices of fuel-fired power plants are determined to a great extent by the quality of fuel, which, unfortunately, has deteriorated in recent years. The ash content and moisture content of coals have increased and their caloric value has decreased. As a result of this, many power plants are experiencing significant operating difficulties, which leads to overexpenditure of fuel.

We understand that this process is objective to a significant degree, and we are trying to somehow adapt to it. Major work is being done in the industry on renovation of basic and auxiliary equipment. New methods of burning low-quality coals are being worked out. In a number of instances, this gives a pretty fair result.

Nevertheless, the delivery of low-quality coals to the fuel-fired power plants causes such damage that the loss easily exceeds the saving of

capital investments which the coal industry obtains by refusing to enrich fuel in the areas where it is produced. The USSR Ministry of Power and Electrification considers it advisable to speed up the construction of so-called "intermediate complexes" in the Ekibastuzskiy basin for the purpose of stabilizing the quality of coal. We consider it expedient to expand the network of coal-enrichment plants in the Donetskiy, Kuznetskiy and Podmoskovnyy coal basins, as well as in a few others. It's necessary to implement stricter control over the quality of coals intended for powdered burning.

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GENERAL

GOSSTROY CHAIRMAN ON POWER CONSTRUCTION

Moscow PRAVDA in Russian 2 Jan 85 p 2

[Article by Gosstroy Chairman S. V. Bashilov: "USSR Under Construction"]

[Text] S. V. Bashilov, Chairman of USSR Gosstroy, responds to a PRAVDA correspondent's request to discuss the current capital works program and ways to better complement it.

First of all, I would like to direct the reader's attention to the following. In the last two years, positive changes have been noted in construction. The fixed capital that is being put into operation is growing at rates which surpass the growth of capital investments. The level of "unfinished projects" has been reduced. The volume of technical retooling and modernization of operating enterprises has increased. The productivity of labor has begun to grow faster. In the program for the year which has begun, these and other positive tendencies are being consolidated and developed.

Special attention has been given to speeding up the return on investment, the volume of which from all sources of financing has been planned at 175.1 billion rubles. State capital investments, including construction and installation work, will grow by 5.5 percent; while fixed capital will increase by 7.6 percent. This means that projects will be completed faster and invested means and resources will be recovered more quickly. The entry into service of fixed capital at a higher rate will allow us to reduce the level of unfinished construction even further and bring it down to levels close to the normative ones.

The scale of renovation and technical modernization of operating enterprises is growing substantially. In all, 30.5 billion rubles of capital investment has been set aside for these purposes. This is 9.3 percent more than last year. Renovation of work stations is the most effective way to utilize capital investments; to shorten the periods required for recovery of investments and to accelerate scientific-technical progress.

Previously, contract organizations did not have a sufficient material interest in the fulfillment of such jobs. Working in the crowded confines of an operating factory is certainly more complicated than erecting new construction projects on cleared ground. The remuneration, however, was

approximately the same. Now, the managers of construction and design organizations and their client enterprises have been granted the right to carry out jobs connected with renovation and technical modernization in accordance with agreed-upon estimates and with [due] regard to the real conditions and character of the work.

Branches of the fuel-power complex will develop at higher rates of speed. It was and it remains, the moving force of the economy. The production of electricity will grow by a total of 55 billion kilowatt hours in the current year. In that regard, more than half of the electricity will be obtained from nuclear power plants. In the current year, power units with capacities of a million kilowatts each will enter service at the Smolenskaya, Balakovskaya, Kurskaya and Zaporozhskaya AES's.

The start up of the power unit at the Beryezovskaya GRES-1 will be the beginning of the power industry's development of the unique coal deposits in the Kansko-Achinskyy territorial-production complex. The Beryezovskaya GRES-1 will become the first in a family of such giants. The first stage of formation of the Yuzhno-Yakutskiy TPK [territorial-production complex] will basically conclude when the Neryungrinskiy surface coal mine and the GRES are operating at full capacity.

The water resources of rivers are becoming actively involved in the matter. New turbines at the Sayano-Shushenskaya, Maynskaya, Baypazinskaya, Tashkumyrskaya and Zhinvali GES's will produce power. The Ekibastuz-Chelyabinsk power transmission lines with a capacity of 1.15 kilo-volts ac will be put into service, as well as a number of others.

The country will get the entire increase in output of oil and gas from increasing their production in Western Siberia. Consequently, the accelerated construction of high-capacity pipelines is stipulated in the first instance for the transport of oil and gas from these areas. The second phase of the gas pipeline Urengo-Tsentr and of the condensate pipeline Urengo-Surgut will enter service.

The volume of capital construction will increase in the coal industry. The "Vostochnyy" surface mine in Pavlodar Oblast, which has a capacity of 15 million tons of coal a year, will begin production. So will the first phase of the "Beryezovskiy" surface mine in Krasnoyarsk Kray and the "Pavlovskiy" No. 1 surface mine in the Maritime Kray. Many enterprises will be renovated.

The metallurgists are called upon to expand the production of effective types of rolled stock. At the Novolipetskiy combine and the Zhdanovskiy plant imeni Il'ich, capacities for production of tin plate for the canning industry will increase. The Dal'nevostochnyy semi-integrated steel works in Komsomol'sk-on-the-Amur will begin production. In a number of plants currently operating, equipment will be installed for the continuous casting of blanks.

A decisive role in the technical retooling of branches [of the economy] belongs to the machine-building industry. There is in prospect the creation

of: capacities for the production of one thousand metal-cutting machine tools in Alma-Ata, grain-harvester combines of the type "Sibiryak" in Krasnoyarsk, trucks with trailers for agriculture in Kutaisi, 1,300 industrial robots at the "Krasnyy proletariy" plant in Moscow and projects in many other cities. The creative collaboration of fitters, planners, customers, and of producers of equipment, structures and materials is required for the successful solution of these tasks.

The introduction of new capacities and the renovation of capacities currently operating in the chemical and petrochemical industries will contribute to the speeding-up of scientific-technical progress. The chemists have also made an important contribution to the implementation of the Food program. The production of the mineral-fertilizer industry will grow by more than 5 million tons a year.

Almost a third of all capital investment as a whole has been set aside for the development of branches of the agroindustrial complex. By the end of the year, the total area of reclaimed lands will comprise almost 35 million hectares. Taking into consideration the construction of installations for the storage and processing of agricultural produce, and of livestock complexes and farms, poultry factories and heating combines, all of this will allow us to improve the supply of food products to the workers.

The deepening of the socialized division of labor and the expansion of economic ties brings to the fore the development and improvement of the transportation system of the country, especially the railroads, as a highly important task. The railroad network will receive further development thanks to the entry into service of about 700 kilometers of secondary tracks and the electrification of 1,500 kilometers of lines. In all, 1,300 kilometers of new railroad will be put into operation.

Of course, it is impossible to characterize the development of all sectors of the economy in a short report. I want to note especially that at the center of the plan for economic and social development of the country in 1985 is, as before, concern about the Soviet man, about his material well-being. Here is just one figure: through all sources of finance, apartment houses with a total area of 114 million square meters will be built. This is almost 11 million square meters more than was projected by the five-year plan. But it's not just quantity that's important. Special attention should be given to raising the quality of residential housing projects and to speeding up the conversion of housing construction to progressive series of buildings. Special attention should be given to avoiding those defects which were pointed out by workers in the letter, "A Word About the Honor of the Builder," which was published in PRAVDA, 8 September 1984.

Tasks for the concluding year of the five-year plan are based on a firm economic foundation. They are strenuous, but realistic. The party puts the task this way: the plan should unquestionably be fulfilled, and where it is possible and necessary, overfulfilled.

The construction ministries should concentrate necessary material-technical and labor resources at construction sites so that worker collectives can work rapidly from the very outset. It's necessary to confirm master schedules for the completion of jobs and the delivery of equipment and materials, for every construction project underway. It's necessary to reinforce the significance of schemes of organization of construction and fabrication of works; to make provision in projects for industrial, highly productive methods of carrying out operations. Without such carefully thought-out documents, directing construction is impossible.

The fulfillment in full of measures stipulated by the resolution of the CPSU Central Committee and the USSR Council of Ministers "On the Improvement of Planning, Organization and Direction of Capital Construction," will unquestionably promote improvement of matters; as will realization of the proposals of comrade K. U. Chernenko concerning problems connected with the consolidation of the material-technical base and the further industrialization of construction.

It is necessary to develop and ratify general and departmental plans for management of construction more quickly; to liquidate excessive layers of management and duplication of effort, and to move the entire system of administration closer to production. It is impossible to delay the reinforcement of the role of trusts also, which are called upon to become in reality the basic link in administration of construction-industry production. This will positively influence the entire organization of things, including the introduction of the multi-crafts brigade contract. It will speed up the commissioning of capacities and improve the quality of finished jobs.

The contemporary stage of development of the country's economy demands great attention to the problems of speeding up scientific-technical progress and rapidly introducing advanced technologies into manufacturing. Much depends here on the planners. The developing of the technical-economic bases of erection of large and complex enterprises, and of other units when necessary, is being implemented again this year. Measures are being developed for the further improvement of planning.

Success in fulfilling the year's construction program depends on millions of toilers. Making the concluding year of the five-year plan a shock year and ensuring the entry into service of all planned units means to answer by deed the summons of the central committee of the CPSU to greet the 27th Congress of the Communist party in a worthy fashion.

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